

# BOTANICAL ABSTRACTS

A monthly serial furnishing abstracts and citations of publications in the international field of botany in its broadest sense

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J. R. SCHRAMM, Editor-in-Chief  
Cornell University, Ithaca, New York

Vol. IX

OCTOBER, 1921

No. 3

ENTRIES 1101-1683

## AGRONOMY

C. V. PIPER, *Editor*

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(See also in this issue Entries 1160, 1324, 1333, 1338, 1386, 1428, 1472, 1558, 1560, 1571, 1611, 1619, 1620, 1621, 1645, 1666, 1677, 1682.)

1101. ANONYMOUS. Bureau of Sugar Experiment Stations Annual Rept. II. 20th Annual Report of the Bureau of Sugar Experiment Stations. 1920. Australian Sugar Jour. 12: 651-655. 1921.—The report covers the period to the end of Oct., 1920.—Experiments with subsoiling as compared with ordinary farm cultivation for sugar cane gave results in favor of subsoiling. Results of experiments on 3 crops subsoiled showed an increase of 9.8 tons of cane and 1.53 tons of cane sugar over the amount obtained from 3 crops with ordinary cultivation. With regard to varieties of the Queensland seedlings planted last year at the Mackay Station, Q. 813 and Q. 1092 germinate and grow quickly, while Q. 970, H. Q. 458, and Q. 1121 are fairly good; Q. 1098 is a later-maturing variety.—*E. K. Tisdale.*

1102. ANONYMOUS. Crop rotation and mixed farming. (Summary of lecture by the Chief Agriculturist to the Midlands Farmers Association.) Rhodesia Agric. Jour. 18: 167-173. 4 pl. 1921.—Attention is called to the fact that a system of crop rotations must be established in Rhodesia before permanent agricultural stability can be achieved.—*E. M. Doidge.*

1103. ANONYMOUS. Field Assistant's Report. Extract from Murray, J. C. Bureau of Sugar Experiment Stations Annual Report II. 20th Annual Report of the Bureau of Sugar Experiment Stations. 1920. Australian Sugar Jour. 12: 655-657. 1921.—The report deals with the growth of varieties of sugar cane in the Cairns District of Australia. Badila has given the most satisfactory results; Green Goru (24B) grows well. A small quantity of "Pompey" recently introduced by the C. R. S. Co. is promising, judging by its healthy erect appearance and vigorous stool. Shahjahanpur is doing well. This variety is a good striker, has a good root system, stools well, grows in an erect manner, has a high sugar content, and a high resistance to frost.—*E. K. Tisdale.*

1104. ANONYMOUS. Le soja. [Soybeans.] Bull. Agric. Congo Belge 11: 151-186. Fig. 23-32. 1920. In the cotton and maize-growing districts soybean is the best annual legume to cultivate, being a fodder plant of great value. The food value of the hay and beans and the methods of cultivating and harvesting the crop are discussed. It is recommended that for hay soybeans and cowpeas be planted together.—*E. M. Doidge.*



1105. ANONYMOUS. Potato Majestic. Gard. Chron. 69: 129. Fig. 57. 1921.—This is a comparatively new variety, popular, a heavy yielder, white, and immune to the wart disease. It often yields 34 tons per acre. The heaviest tuber weighed 11 pounds and 15 ounces.—*P. L. Ricker.*

1106. ANONYMOUS. School experiment plots at Yass. Agric. Gaz. New South Wales 32: 342. 1921.—This is a brief note on cereal trials conducted at Yass.—*L. R. Waldron.*

1107. ANNETT, H. E. Some experience with poppy growers in the United Provinces. Agric. Jour. India 16: 19–23. 1921.—ANNETT having found that the opium obtained from successive lancings of poppy capsules at intervals of 2 or 3 days showed a progressive decrease in morphine content, the Government of Bengal offered a reward to cultivators bringing opium in 2 portions, one the product of the 1st lancings, the other that of successive lancings. Two years' experience showed that the opium purporting to represent the 1st lancings was lower in morphine than there was reason to expect. An investigation showed that only 54 per cent of the cultivators lived up to their obligations, the remainder through dishonesty or carelessness having failed to keep separate the opium from the 1st lancings.—*W. W. Stockberger.*

1108. BIEREL. Die Bedeutung der Gründüngung im landwirtschaftlichen Betriebe im Allgemeinen und für den Kartoffelbau im Besonderen. [The importance of green manuring in the system of agriculture in general and for potato culture in particular.] Illus. Landw. Zeitg. 41: 67–68. 1921.—Green manuring is considered indispensable for the increase in yields of potatoes. Depending on environmental conditions and the character of soil, green manuring may be introduced in the rotation either as a main crop, or as a stubble crop, or as an undercrop. The same conditions should determine the selection of the legume to be sown. Lupine, serradella (for lighter soils), and yellow clover (for heavier soils) are considered among the most important.—*M. Shapovalov.*

1109. BLAIR, A. W., AND B. E. BROWN. The influence of fertilizers containing borax on the yield of potatoes and corn. Season 1920. Soil Sci. 11: 369–383. Pl. 1–4. 1921.—Borax in quantities from 1 to 400 pounds per acre and mixed with a fertilizer containing cottonseed meal, acid phosphate, and muriate of potash was applied to corn and potatoes in 3 ways. The borax was drilled in the furrow 2 or 3 weeks before planting, drilled in at the time of planting, or broadcast at the time of planting. For potatoes with the 1st method 50 pounds of borax per acre had little or no effect; 100 pounds reduced the yield  $\frac{1}{2}$ ; and 400 pounds produced a failure. With the 2nd method 30 pounds caused a drop in yield and 50 pounds reduced it to  $\frac{1}{3}$ . With the 3rd method 50 pounds decreased the yield slightly. For corn with the 1st method germination was reduced with 20 pounds per acre, as little as 5 or 10 pounds reducing it with the 2nd and 3rd methods. Using the 1st method a depression of yield was produced by 100 pounds per acre but none by 50 pounds; with the 2nd and 3rd methods 50 pounds reduced the yield to  $\frac{1}{3}$ .—*W. J. Robbins.*

1110. BREAKWELL, E. Progress report on farmers' grass plots. Agric. Gaz. New South Wales 32: 364. 1921.—Brief notes are given on *Phalaris bulbosa*, *Pennisetum longistylum*, and on other grasses of lesser importance grown at Dorriggo and Hargreaves.—*L. R. Waldron.*

1111. BRESSEL, KURT. Erfahrungen im Anbau von Frühkartoffeln in der Börde. [Experiences in raising early potatoes.] Illus. Landw. Zeitg. 41: 75. 1921.—The advisability of changing seed potatoes annually, or at least bi-ennially, is emphasized, and a few suggestions as to their care and culture are given.—*M. Shapovalov.*

1112. CHUNG, H. L. Report of the Agronomy Division. Hawaii Agric. Exp. Sta. Rept. 1919: 44–49. Pl. 5–6. 1920.—Guam and Cuban corn varieties have been under test, producing respectively 52.5 and 30.4 bushels per acre; both are resistant to the leaf hopper. An interesting mutant in Early Refugee beans is noted. Reports on experimental work with sweet potatoes, field turnips, dryland taro, pigeon peas, cassava, edible canna, field beets, field carrots, Irish potatoes, annual white sweet clover, alfalfa, and various grasses are included.—*J. M. Westgate.*



1113. COMPTON, R. H., AND J. W. MATHEWS. The cultivation of buchu. Jour. Dept. Agric. South Africa 2: 223-228. 3 fig. 1921.—The climate of the winter-rain belt is naturally suited to the requirements of buchu; the plant is propagated by seed and "dry" cultivation is practiced. Directions are given for harvesting and marketing buchu, and the yield of resin and oil from various species of *Barosma* is compared.—E. M. Doidge.

1114. CZUBER, E. Beziehung zwischen Parzellengrösse und Fehler der Einzelbeobachtung bei Feldversuchen. [Relation between size of plats and error in detached observations in field experiments.] Zeitschr. Landw. Versuchsw. Deutschösterreich 23: 61-68. 1920.—The results of a series of plat experiments, in which the yields of rye, oats, potatoes, and rape were reported upon by W. VAGELER in Jour. Landw. for 1919, page 97, are discussed. The present writer takes Vageler's data and by a different mathematical treatment obtains different results for the ratio of percentage of error to size of plats. His methods are given in detail.—John W. Roberts.

1115. DOWNING, R. G. Trials of canary seed. Agric. Gaz. New South Wales 32: 308. 1921.—Trials were conducted with *Phalaris canariensis* (?) on 4 experimental farms with fairly satisfactory results. At Cowra 730 pounds of seed per acre were secured.—L. R. Waldron.

1116. ECKENBRECHER, C. Anbauversuche der Deutschen Kartoffel-Kultur-Station im Jahre 1920. [Cultural studies of the German potato-culture station in 1920.] Illus. Landw. Zeitg. 41: 74-75. With colored pl. 1921.—German varieties of potatoes (21) were studied with respect to tuber yields, starch content, and starch yields. The highest tuber-yielding variety (Blücher) appeared to be also the highest starch-yielding variety and, in general, a great deal more parallelism exists between the high total yields and the high starch yields than between either of these 2 and the starch content.—M. Shapovalov.

1117. GALANG, F. G. Yam culture. Philippine Agric. Rev. 13: 63-72. Pl. 3. 1920.—Cultural directions and yield data are given for various species of *Dioscorea*, especially *D. alata* and *D. esculenta* (*D. aculeata*).—E. D. Merrill.

1118. GAYLORD, F. C. More and better potatoes. Proc. Amer. Soc. Hort. Sci. 17: 99-102. 1920 [1921].—Striking results have been obtained following an organized effort in Indiana to demonstrate to the growers the best methods of handling the potato crop. The average increase in production in 1919 of 12 demonstration fields was about 25 per cent.—H. A. Jones.

1119. GHESQUIERE, JEAN. Rapport concernant les machines pour la traitement des semences de coton contre les teignes. [Report on machinery for the treatment of cotton seed against moths.] Bull. Agric. Congo Belge 11: 147-150. 1920.

1120. GOFF, R. A. Report of the Glenwood Substation. Hawaii Agric. Exp. Sta. Rept. 1919: 68-73. 1920.—At the Glenwood Substation experiments were conducted with Irish potatoes, sweet potatoes, Maui red beans, dryland taro, licorice roots, poha (*Physalis* spp.), alfalfa, sweet clover, corn sorghum, edible canna, cassava, pigeon peas, and grasses.—J. M. Westgate.

1121. HEINZE, B. Der erfolgreiche Anbau der Oelbohne in unserem eigenen Lande. [The successful cultivation of the soybean in our own land.] Illus. Landw. Zeitg. 41: 59-60. 1921.—The author calls attention to the importance of the soybean as a food for man and animals and argues for the possibility of its successful culture in Germany.—John W. Roberts.

1122. HILTNER, L. Über die Impfung der Futter- und Zuckerrüben. [Inoculation of feed and sugar beets.] Mitteil. Deutsch. Landw. Ges. 36: 243. 1921.—A brief discussion is presented of the conclusions reached concerning the value of some German bacterial preparations to non-leguminous plants, with special reference to an inoculating material obtained from soils exceptionally well adapted to the growing of beets. In very limited experiments beets



treated with this preparation produced crops exceeding those from the untreated plots by as much as 26.7 per cent. It is stated that the treatment of non-legumes with cultures of bacteria is still in the experimental stage.—*Lewis T. Leonard.*

1123. ISIDRO, R. A. Comparative culture of upland and lowland rice with special reference to cost of production and distribution of income. *Philippine Agric.* 8: 213-233. 1920.—The general conclusions are that lowland culture gives a higher yield than upland culture, but the cost per unit area is higher.—*E. D. Merrill.*

1124. K [ENOYER], L. A. [Rev. of: CHILCOTT, E. C., AND JOHN S. COLE. Sub-soiling, deep tilling and soil dynamiting in the Great Plains. *Jour. Agric. Res.* 14: 481-521. 1918.] *Jour. Indian Bot.* 2: 92. 1921.

1125. KIESSELBACH, T. A., AND F. D. KEIM. The regional adaptation of corn in Nebraska. *Nebraska Agric. Exp. Sta. Res. Bull.* 19. 64 p., 13 fig. 1921.—The general morphological characters of the plant and the histological structure of the leaf were studied for corn types known to be acclimated to various regional areas of Nebraska. Adaptation of corn to divergent climatic conditions consists in a morphological rather than in a histological reaction. While some of the vegetative characters, such as total leaf area and plant weight, may differ as much as 300 per cent, in the case of native types growing in the more adverse as compared with the most favored parts of the state, no important histological leaf characters exhibited a difference of more than 15 per cent.—The actual hereditary difference (apart from environmental effects) between types adapted to favorable and to unfavorable climatic conditions may be brought out by comparing both in the same environment under favorable conditions. When eastern and western Nebraska corn were grown comparably at the Nebraska Experiment Station in Lancaster County, western Nebraska corn was much reduced in plant size, leaf area, and dry matter. Plants from seed of both sources were rather similar as to leaf thickness, epidermal and cuticular thickness, relative number of vascular bundles, number of stomata per unit leaf area, and size of stomata. It is concluded that adaptation of corn to a region of moisture shortage consists chiefly in the reduction of vegetative development and consequent reduction in the amount of water used by the individual plant. Comparative yield tests of corn from various sources indicate that, in general, native seed is superior to imported seed, though it is possible to introduce seed from a distance which gives entirely satisfactory results.—*T. A. Kiesselbach.*

1126. KOCH, PIETER. Curing of Turkish tobacco. *Jour. Dept. Agric. Union of South Africa* 2: 409-421. *Fig. 1-7.* 1921.—The author discusses the best methods of handling Turkish tobacco in the Western Province of South Africa. Ripening, harvesting, and curing are treated in separate paragraphs. There are 3 stages of curing: 1st, wilting in a wilting room; 2nd, drying in the sun; and 3rd, fermentation. Each stage is described in detail.—*E. M. Doidge.*

1127. KRAUSS, F. G. Report of the Extension Division. *Hawaii Agric. Exp. Sta. Rept.* 1919: 56-67. *Pl. 9-10.* 1920.—At the Haiku Demonstration and Experimental Farm variety tests and breeding work with numerous varieties of diversified crops were conducted. One thousand acres of pigeon peas were planted as a result of the Haiku demonstrations.—*J. M. Westgate.*

1128. LANG, E. Die betriebswirtschaftliche Stellung des Kartoffelbaues unter den gegenwärtigen Verhältnissen. [Economic organization of the potato industry under present conditions.] *Illus. Landw. Zeitg.* 41: 65-67. 1921.—Owing to the impossibility of increasing the area for potato culture, it is imperative to produce more on a given area. In this connection, the importance of extensive use of farm machinery, better organization and utilization of labor, proper fertilization, and the use of good seed are discussed.—*M. Shapovalov.*



1129. LANSDELL, K. A. *A South African gum. (Combretum erythrophyllum Burch.)* Jour. Dept. Agric. Union of South Africa 1: 834-837. 1920.—This plant, growing in the neighborhood of Pretoria, produces a gum which promises to be as valuable in tanning as Gum Tragacanth. Description of the tree with illustrations and copy of a report on the gum by the Imperial Institute are given.—*E. M. Doidge.*

1130. LANSDELL, K. A. *Pappea capensis* seed. Jour. Dept. Agric. Union of South Africa 1: 760-764. 1 pl. 1920.—It was found that whole seed of *Pappea capensis* yield 47.8 per cent of oil and the decorticated kernels 73.5 per cent. The oil is of a non-drying type suitable for soap making or use as a lubricant. The chemical analysis of the meal after the oil is expressed shows a slight inferiority to cotton seed meal. No feeding tests of the meal were conducted. An illustration and description of the plant are given.—*E. M. Doidge.*

1131. LEPLAE, E. *La culture du coton au Congo belge (1915-1919).* [Cotton culture in Belgian Congo, 1915-1919.] Bull. Agric. Congo Belge 11: 80-106. Fig. 19-22. 1920.—This is an account of the establishment and extension of cotton culture during the period under review. The natives of Maniema, Sankuru, and Kasai have adopted cotton as a staple crop; the sale of cotton produces a considerable revenue and the acreage under cotton increases rapidly. The natives planted 45 hectares in 1916, 800 in 1917, 1000 in 1918, and 2000 in 1920. Of the varieties tested Triumph Big Boll and Simpkins have given the best results.—*E. M. Doidge.*

1132. MAINWAIRING, C. *Maize for export, with notes on grades and grading.* Rhodesia Agric. Jour. 18: 174-178. 1 fig. 1921.—Grades for export maize in the Union of South Africa, Portuguese East Africa, and Southern Rhodesia are given. Special advice is given as to condition and quality of bags, and general advice with reference to exporting.—*E. M. Doidge.*

1133. MASON, T. G. *Nep.* Agric. News [Barbados] 20: 22. 1921.—After tracing the life history of the lint hair, as given by BALLS, the author concludes that the prospects of reducing "nepiness" are not promising under ordinary conditions, the only feasible suggestion being that of growing a strain of cotton similar to that isolated in St. Vincent by Dr. HARLAND, and characterized by a low rate of boll-shedding. If this were planted so that maximum boll-production occurred in the drier months, the deposit of secondary cellulose might be expected to proceed uniformly. Success would seem to depend on the recognition and elimination of strains forming an abnormal number of flabby fibers.—*J. S. Dash.*

1134. MASON, T. G. *The water factor in crop production.* Agric. News [Barbados] 19: 355. 1921.—The 2 main points discussed by the author are (1) selecting plants adapted to local conditions, and (2) adjusting the water factor of the environment to the needs of the plant. Certain cultural methods are referred to,—dust mulch, the use of a trash mulch for sugarcane, and wider spacing of certain crops, such as maize.—*J. S. Dash.*

1135. MELLE, HENRY A., AND SYDNEY M. STENT. *Fodder and pasture grasses of South Africa. 1. Sudan grass. (Sorghum sudanense Stapf.)* Jour. Dept. Agric. Union of South Africa 2: 425-433. 4 fig. 1921.—Sudan grass is closely related to the kafir, broom, and sweet sorghums, but yields superior hay; 3 or 4 cuttings can be obtained under favorable conditions. The yields vary from 2 to 8 tons of hay per acre. Sudan grass grows well in districts suitable for kafir corn and is recommended for cultivation in areas where it is too hot and dry for the successful growing of teff.—*E. M. Doidge.*

1136. MÜNTER, F. *Sonnenblumen und Helianthi und Mais als Silagemasse.* [Sunflowers, Helianthi, and maize as silage.] Illus. Landw. Zeitg. 41: 44. 1921.—The author reports chemical analyses of dried sunflower, Helianthi, and maize at various stages in their development. The Helianthi were highest in albumen content, but the latter decreased in all the plants as they approached maturity. When the Helianthi are harvested late for silage they should be mixed with leguminous plants. In general, the sunflowers should be cut at any time between



the beginning of full bloom and seed in the "milk" stage. Maize should be harvested shortly before the grains are mature, because of the increase in nitrogen-free extracts and fats at that stage.—*John W. Roberts.*

1137. PAGUIRIGAN, D. B. Tobacco growing in the Philippines. Bur. Agric. Philippine Islands Bull. 34. 26 p., 9 pl. 1919.—A popular treatise on the subject with special reference to Philippine conditions.—*E. D. Merrill.*

1138. PARISH, E. Wheat and its cultivation. Jour. Dept. Agric. Union of South Africa 2: 322-332. 1921.—Extracts are presented from Bull. 22, Dept. Agric. Victoria, Australia, with notes concerning the applicability of wheat growing in South Africa, with special reference to the southwestern wheat areas of the Cape.—*E. M. Doidge.*

1139. PATE, W. F., AND R. Y. WINTERS. Spacing cotton on North Carolina soils. North Carolina Agric. Ext. Serv. Circ. 112. 7 p. 1921.—Tests extending over a series of years show that best yields of cotton in several localities of North Carolina were secured from 3½-foot rows with 16 inches—in 1 locality 12—between hills.—*F. A. Wolf.*

1140. PETHYBRIDGE, GEORGE H. Is it possible to distinguish the seeds of wild white clover from those of ordinary white clover by chemical means during a germination test. Econ. Proc. Roy. Dublin Soc. 2: 248-258. 1919.—As the seed obtained from wild white clover produces much longer-lived stands than that obtained from cultivated white clover and commands a higher price, an effort was made to determine whether adulteration of the former with the latter could be detected. Seedlings from wild stock from different sources were found generally to give off HCN in sufficient quantity for detection by the picric acid test; those from ordinary stock obtained from England generally gave off much less or none at all. However, some of the ordinary clover seed imported from Canada and America gave off HCN in germinating, making the HCN test of value chiefly where negative results were obtained, indicating adulteration with acyanophoric ordinary seed; and of little value where the wild seed is adulterated with cyanophoric American or Canadian ordinary seed.—*Charles Drechsler.*

1141. RASMUSSEN, H. J. Fodringspørgsmaalet. [Questions on feeding.] Tidsskr. Landokonomi 1921<sup>4</sup>: 142-162. 1921.—A lecture in which Danish farmers are urged (1) to raise more feed at home, especially timothy and alfalfa, so as to eliminate as far as possible the importation of animal feed; (2) to build silos and feed ensilage in the same manner as American farmers. The results of feeding experiments by ARMSBY of the Pennsylvania State College are quoted.—*Albert A. Hansen.*

1142. ROSENFELD, ARTHUR H. Saving money with frozen cane. Internat. Sugar Jour. 23: 316-319. 1921.—After a killing freeze in northern Argentina, the frozen cane was used as a mulch between alternate rows of 1st-year stubble,—following the principle of using trash in the Cuban cane fields; a saving of labor and money resulted. In the unirrigated sections, the mulched fields produced slightly better yields than the regularly cultivated ones.—*C. Rumbold.*

1143. RÜMKER, UND R. LEIDNER. Sommerweizenanbauversuche. [Culture experiments with summer wheat.] Illus. Landw. Zeitg. 41: 58-59. 1921.—A report is presented of plot experiments for the testing of different varieties in Bornstedt (1919) and Emersleben (1920). The results are given in tabular form and include time of heading, time of blooming, resistance to rust and smut, length and thickness of heads, color of grains, weight of 100 grains, and yield.—*John W. Roberts.*

1144. SHEPHERD, A. N. Farmers' experiment plots. Potato trials, 1920. Murrumbidgee irrigation areas. Agric. Gaz. New South Wales 32: 309-312. 1921.—Four settlers cooperated in conducting trials, 7 varieties being grown. Up-to-Date produced the largest yields. Mineral fertilizers increased the net returns, in one case by \$140 per acre.—*L. R. Waldron.*



1145. SNELL, KARL. Das Kartoffelsorten Archiv des Forschungs-Institutes für Kartoffelbau. [Potato-variety records of the institute for investigations in potato culture.] Illus. Landw. Zeitg. 41: 74. 1 colored pl., 1 fig. 1921.—A system of photographic records of characteristic features of various varieties has been perfected and gives very satisfactory results as a substitute for fresh specimens.—*M. Shapovalov*.

1146. STÜMPPEL, E. Verdoppelung der Kartoffelernten durch starke Stickstoffdüngung. [Doubling potato yields by heavy nitrogenous fertilization.] Illus. Landw. Zeitg. 41: 69. 1921.—Attention is drawn to the advantages of using commercial fertilizers and lime for potato fields.—*M. Shapovalov*.

1147. THOMPSON, O. A. Twelfth to eighteenth annual reports Edgeley Sub-station, 1914-1920. North Dakota Agric. Exp. Sta. Bull. 145. 44 p., 1 fig. 1921.—Yields are presented of 24 varieties of spring wheat for 1908-1916 and for 10 varieties for 1920. The 1920 yields varied greatly due to attacks of stem rust. The new rust-resistant variety of common wheat, Kota, greatly outyielded all other common varieties and was exceeded only by Monad, Acme, and "D-5,"—rust-resistant durums. Flax variety yields are given for 1912-1916; but little variation is shown. The oat variety Siberian White, and the barley variety Oderbrucker, have been consistent high yielders.—In a comparative trial of forage crops extending over 12 years, brome-grass (*Bromus inermis*) yielded on an average 1.36 tons, alfalfa 1.04 tons, common red clover 0.58 tons, and maize 1.98 tons per acre. Foxtail millets yielded an annual average of about 2.5 tons of hay for 5 years. Notes are given on field peas, sweet clover, slender wheat-grass (*Agropyron tenerum*), and rape.—Early Ohio and Early Six Weeks are said to be the best-yielding potato varieties. Notes are given on potato culture.—In a trial covering 6 years, oats were seeded at 10 different rates, from 3 to 12 pecks per acre. The highest net yield was secured from the 8-peck rate. In a similar trial with barley the 6-peck rate gave the highest net yield. Similar trials were conducted for both common and durum wheats for a period of 7 years with rates from 2 to 11 pecks per acre. With durum wheat the largest net yield was secured from the 7-peck rate, closely approached by that of the 5-peck rate. With common wheat the largest net yield resulted from sowing 8 pecks per acre, but seedings of 5, 6, and 7 pecks gave only slightly lower yields.—Early fall plowing produced better yields in continuous wheat culture trials than later fall plowing. All spring methods, on the average, outyielded all the fall methods, in preparing ground for continuous wheat culture, by 3.2 bushels per acre.—In continuous cropping experiments with common and durum wheats, oats, and barley, plowing 6 inches deep gave yields as good or better than those secured from 6-inch plowing accompanied by subsoiling alone or subsoiling and packing. Subsoiling was done every 4th year.—Yields of grain are given for wheat, oats, and barley, and fodder of maize when grown under methods of (1) continuous cropping and (2) alternate cropping with clean summer tillage. Yields of wheat were increased by 14 per cent under alternate clean summer tillage. Increased barley yield was but slightly better on the clean summer tillage. Yields of oats were increased 52 per cent by alternate tillage. An absolute loss of maize fodder resulted when grown on clean summer tillage, the cleanly cultivated soil seeming to have an inhibitory effect upon maize yields.—When wheat or oats followed fallow in a rotation the increase in yield, compared with that secured from these crops following small grain in rotation, was not over 20 per cent.—Averaging the results of 13 years, little or no advantage was secured in plowing under a green manure crop of winter rye, field peas, or sweet clover preparatory to growing wheat or oats, in comparison to the same crops grown after clean summer fallow. In a 4-year rotation where wheat followed a clean-cultivated, manured summer fallow, the increase in yields of wheat compared with unmanured trials was 1.8 bushels per acre, or 11 per cent. The increased yield of fodder of the succeeding maize crop was 877 pounds, or 25 per cent, and the increase in yield of the next succeeding oat crop 8.2 bushels, or 24 per cent. In similar rotations, in which, however, oats followed manured fallow, the increases in yield were: Oats, 1.3 bushels, or 3 per cent; maize fodder, 967 pounds, or 28 per cent; and wheat, 1.7 bushels, or 10 per cent. These results are the averages of 12 years.—In a series of 3-year rotations, wheat and barley yielded more following maize than when following clean summer tillage (average of 14 years' results). Oats yielded 4.9 bushels, or 12



per cent, more after fallow than after maize. As an average of results for 13 years, oats following small grain yielded 4.9 bushels, or 13 per cent, more than when following sod crops,—alfalfa, smooth brome-grass, and clover; the lowest yield followed alfalfa. Wheat, oats, and barley following maize yielded more than when following small grains.—In a comparison of disking versus plowing maize ground as a preparation for wheat and oats, the results for an average of 14 years were slightly in favor of the disked ground.—In fertilizer experiments with wheat, oats, barley, and maize, using manure and mineral fertilizers, distinct positive results were secured only with maize. Progress data are presented upon experiments designed to maintain soil productivity on the Edgeley loam.—Notes are given on suitable trees and methods of tree planting, especially with relation to farmsteads. Suitable varieties of apples, plums, and small fruits are indicated.—*L. R. Waldron.*

1148. WALTERS, J. A. T. Winter wheat. Results of co-operative experiments 1921. Rhodesia Agric. Jour. 18: 181-183. 1 pl. 1921.—A summary is presented of reports of experiments with 4 varieties of winter wheat, namely, Early Gluyas, Florence, Black Persian, and Yellow Cross; results are given for both irrigated and unirrigated lands.—*E. M. Doidge.*

1149. WESTER, P. J. Cultural directions for field crops and vegetables. Philippine Agric. Rev. 13: 80-88. Pl. 1-7. 1920.—Brief notes are given on the general cultivation of vegetables and field crops, such as ragi, rape, sembu, and sunflowers, with tabulated directions for planting.—*E. D. Merrill.*

1150. WESTER, P. J. Notes on adlay. Philippine Agric. Rev. 13: 217-222. Pl. 1-4. 1920.—The author strongly urges the more extensive cultivation and utilization of *Coix lachrymans* Linn. var. *mayuen* Stapf, a variety of the common Job's tears with soft, thin, involucre instead of the very hard one in the typical form. This has been cultivated for many centuries by the more backward peoples in the Indo-Malayan region.—*E. D. Merrill.*

1151. WHITTET, J. N. A promising introduction. Kikuyu grass (*Pennisetum longistylum* Hochst.). Agric. Gaz. New South Wales 32: 313-322. 5 fig. 1921.—Reports from 10 experiments with this grass are briefly stated. The grass holds out much promise for Australian conditions. Cultural notes and an analysis are given. A test shows the grass to be favorable for milk production.—In a palatability test with 14 grass species, Kikuyu grass ranked 3rd, *Bromus inermis* 1st, *Phleum pratense* 6th, *Poa pratensis* 7th, and *Bouteloua oligostachya* 13th.—*L. R. Waldron.*

1152. WILLIAMS, C. B. I. Fertilizers for crops commonly grown in North Carolina. Bull. North Carolina Dept. Agric. 1921: 13 p. May, 1921.—Recommendations are given of the kind and amount of commercial fertilizer to be used for cotton, cereals, tobacco, and leguminous crops in the coastal plain, Piedmont, and mountain sections of North Carolina.—*F. A. Wolf.*

1153. WILLIAMS, C. B. Report of the Division of Agronomy. Ann. Rept. North Carolina Agric. Exp. Sta. 43: 15-31. 1920 [1921].—A general statement is presented covering the investigations in soil fertility at the several test farms, tests with nitrate of soda on cotton in the Piedmont section, fertilizer tests with wheat in the mountain section, and results of seed selection with soybean, cotton, wheat, and corn.—*F. A. Wolf.*

1154. ZIELSTORFF, W. Über Haferdüngungsversuche mit fallenden Phosphorsäuregaben. [Fertilizer experiments on oats, using decreasing quantities of phosphoric acid.] Mitteil. Deutsch. Landw. Ges. 36: 213-215. 1921.—Field experiments were carried out at Polenshof and Ludwigswalde; also pot experiments with soils from these fields. Though neither field reacted in any way to phosphoric acid, a decided need for this ingredient was shown in the pot experiments; this may have been due to a deficiency in rainfall during the summer months. There was also lack of agreement between the field and pot experiments as regards potash, for which no explanation appears. Further experiments are necessary to furnish an explanation.—*Albert R. Merz.*



1155. ZOOK, L. L. Winter wheat seed-bed preparation. Nebraska Agric. Exp. Sta. Bull. 178. 16 p., 1 fig. 1921.—Results are reported from the North Platte Nebraska Exp. Substa. secured during 8 years, 1912-1919, from packed and unpacked soil plowed at various depths. On 4 plats plowed at each of 4 depths (3, 7, 10, and 14 inches) for 8 years: (1) The highest yields were secured from the intermediate depths of plowing; (2) the lowest average yield was secured from plowing 3 inches deep; (3) the increase in yield from 7-inch plowing over that secured from 3-inch plowing was sufficient to justify plowing at the greater depth; (4) the yields from plowing 7 and 10 inches deep were practically the same,—no advantage was gained from plowing at a depth greater than 7 inches; (5) the 14-inch, or very deep, plowing produced the lowest yields of any except the 3-inch plowing; (6) the depth of plowing had no appreciable effect upon the storage or use of soil moisture; (7) higher yields were secured from early than from late fall plowing, but the differences were not great; (8) better yields followed packing. Deep tillage experiments conducted by the U. S. Dept. Agric. in 12 states showed the practice to be unprofitable at all stations.—*T. A. Kiesselbach.*

## BIBLIOGRAPHY, BIOGRAPHY, AND HISTORY

NEIL E. STEVENS, *Editor*

(See also in this issue Entries 1244, 1280, 1281, 1311, 1447, 1592, 1606, 1683)

1156. ANONYMOUS. In commemoration of the centenary of the birth of Sir William Macleay. Proc. Linn. Soc. New South Wales 45: 218-219. 1920.—William Macleay (1820-1891) came to Australia in 1839 with his cousin, William Sharp Macleay (1792-1865). In memory of the scientific usefulness and influence of the family, exhibits of relics and portraits were shown and memorials prepared. The Macleay collections are now in the possession of the University of Sydney.—*Eloise Gerry.*

1157. ANONYMOUS. John Goodyer and Lobel. Gard. Chron. 69: 157-158. 1921.—Manuscripts were exhibited by Dr. R. T. GÜNTHER at a recent meeting of the Linnean Society of London which were bequeathed to Magdalen College by John Goodyer with his botanical library in 1664. These include his own translations of Theophrastus and Dioscorides, the latter said to have never been undertaken by any other scholar. One volume contains a long list of grasses with synonyms and short descriptions copied from Lobel's MSS. (now lost?); an index of plants in Goodyer's hand, an index to Gerard's Herbal (1597) and Stonehouse's Catalogue of plants in his garden at Darfield in 1640. The loose papers comprise part of the MS. for Lobel's projected *Stirpium Illustrationes*, now bound in 3 parts, the 1st containing descriptions of 223 species of grasses. Selections from this by How were printed in 1655. Two other volumes contain synonyms of plants used by Goodyer, and a small fern and moss collection. The miscellaneous papers include dated descriptions by Goodyer of some 90 new or rare species, and lists of plants from the gardens of William Coys in Essex in 1616. Goodyer's notes also show that Mr. "Coel," Lobel's son-in-law, was identical with Master James Cole, London merchant, mentioned by Gerard. Lobel had another son-in-law, Ludovicus Myreus, a London apothecary referred to by Clusius in his *Exotica*.—*P. L. Ricker.*

1158. ANONYMOUS. Mr. Joseph Cheal, V. M. H. Gard. Chron. 69: 170. *Portrait.* 1921.—Cheal is specially interested in fruit growing and is a leading spirit in the National Dahlia Society.—*P. L. Ricker.*

1159. ANONYMOUS. Mr. Kingdon Ward. Gard. Chron. 69: 122. *Portrait.* 1921.—A brief notice is presented of Ward's work as botanical explorer in China and announcement of a new expedition to Szechuan and Yunnan.—*P. L. Ricker.*

1160. ANONYMOUS. Origin of the Uba cane. Noel Deerr's opinion versus local account. South African Sugar Jour. 5: 187, 189. 1921.—Deerr's article (see Bot. Absts. 8, Entry 16), which is here quoted entire, concludes that the Uba came to Natal, by way of Mauritius, from



Brazil, whence it received its name from "Vuba," used in Brazil for sugar cane as early as 1650; but the local story reaffirms its Indian origin. About 30 years ago sugar cane varieties from Egypt, Louisiana, Mauritius, West Indies, and India were planted on the Reunion estate of Mr. de Pass, near Durban, Natal. The last box to arrive was left underneath the bins in the mill until the tops were almost dead, but, when planted, 2 of them grew and flourished, and eventually a variety was clearly established. On the label attached to the cane tops only 3 letters could be found, which were deciphered as "Uba," but there was no doubt that these tops came from Poona, and it is assumed that the last letters of this word were misread as "Uba." This is the local account as given by George Wade, overseer of the mill, 5 years after the finding of the cane tops.—*E. K. Tisdale*.

1161. ANONYMOUS. Sir Frederick W. Moore, V. M. H. *Gard. Chron.* 69: 158. *Portrait*. 1921.—A biographical sketch is given of the keeper of the Royal Botanical Gardens, Glasnevin, Dublin, in which position he was preceded by his father, David Moore, who took charge in 1835 and held the position for 41 years. The son has now been there 41½ years.—*P. L. Ricker*.

1162. ANONYMOUS. The drug business in Colonial times. *Pharm. Era* 53: 199–200. 1920.—Gleanings from newspaper advertisements of the 18th century, with reproduction of one by G. Duykinck of New York, August 3, 1769.—*Neil E. Stevens*.

1163. ARBER, AGNES. Plants and flowers in Chinese poetry. *Gard. Chron.* 69: 163. 1921.—References are given to recent translations of Chinese poetry by H. A. Giles (1898) and A. D. Waley (1918 and 1919).—*P. L. Ricker*.

1164. BEILLE, LUCIEN. Un botaniste bordelais. Léonce Motelay 1830–1917. [Léonce Motelay, 1830–1917, a Bordelais botanist.] *Actes Soc. Linn. Bordeaux* 70: 493–509. *Portrait*. 1917–18 [1920?].—Motelay was a member of the Linnean Society of Bordeaux for more than 60 years and contributed many papers to its publications, the monograph of *Isoëtes* by Motelay and Vendries, presented in 1879, being of special note. His herbarium, consisting of a general collection and flora of the Gironde, was presented to the city of Bordeaux in 1906.—*M. F. Warner*.

1165. BIER, PAUL. L'herbier tricolore de Bory de Saint-Vincent. [The tricolored herbarium of Bory de Saint-Vincent.] *Bull. Mus. Hist. Nat. Paris* 26: 429–431. 1920.—The tradition that Bory, like Bosc and other liberal botanists, used red, white, and blue papers in his herbarium as a protest against the restoration of the white flag of the monarchy in France, receives confirmation in the discovery of a portfolio of sheets in the 3 colors, some of them showing the impression of algae, among the remainders of the herbarium of BORNET, who possessed Bory's entire collection of algae; also of blue wrappers containing single red sheets evidently identical with a red mount found with one of Bory's fungi.—*M. F. Warner*.

1166. [BRITTEN, JAMES.] Magnus Spence. *Jour. Botany* 57: 293. 1919.—Spence died at St. Ola, Orkney, Aug. 20, 1919, aged 66. He was a teacher, long headmaster at Deerness, who published the *Flora Orcadensis* (1914), and had special knowledge of the marine algae of the Orkneys.—*Neil E. Stevens*.

1167. [BRITTEN, JAMES.] William Black [i.e., Brack] Boyd. *Jour. Botany* 56: 221–222. 1918.—Boyd died Mar. 6, 1918, in his 88th year. He was one of the best-known Scottish amateur gardeners, greatly interested in alpine, and had one of the finest collections in the United Kingdom. He collected a number of very rare Scottish plants.—*Neil E. Stevens*.

1168. [BRITTEN, JAMES.] William Frederick Miller. *Jour. Botany* 56: 221. 1918.—Miller was born Sept. 18, 1834, the only son of William Miller the well known engraver, and was himself in the business of engraving and color printing. He communicated to the *Journal of Botany* many notes on rare Scottish plants from his vacation rambles, and later, when he retired from business and removed to Somersetshire, notes on plants of that county. He died Apr. 28, 1918.—*Neil E. Stevens*.



1169. CAMUS, FERNAND. Documents pour servir a l'histoire de la botanique dans l'Ouest de la France. I. Une lettre inedite de François Bonamy. [Documents relating to the history of botany in the west of France. I. An unpublished letter of François Bonamy.] Bull. Soc. Sci. Nat. Ouest France III, 5: 31-51. 1915-19 [1920?].—A letter found in the Bornet-Thuret cryptogamic collection at the Paris Natural History Museum, transmitting to A. L. de Jussieu specimens of *Ephedra*, is occasion for notes on Bonamy's *Florae Nannetensis Prodrromus* (1782) and its Addenda (1785), with a few personal data in regard to the author.—*M. F. Warner*.

1170. CHRISTY, MILLER. Wistman's wood on Dartmoor. Country Life [London] 49: 812-813. *Illus.* 1921.—This is a unique bit of woodland in the heart of Devon, established in a heap of angular masses of granite, and stretching along the steep side of the valley of the East Dart for perhaps 400 yards, nowhere over 100 yards wide. With the exception of 3 or 4 bushes of mountain ash, it consists of oaks, all apparently *Quercus pedunculata*. Though of great age, they are amazingly dwarfed and stunted, their average height being about 10 feet, the highest not over 15, while in girth the average is 40-60 inches, and 1 tree measured 78. They are in vigorous condition, producing acorns, and a number of young trees are found among them. There is a remarkable epiphytic growth of mosses, lichens, and polypody, possible only on trees of great age and in an exceedingly moist climate, there being an average rainfall possibly exceeding 80 inches. The wood was described by Tristram Risdon 300 years ago exactly as it exists today, and although the tradition that it is entered in the Domesday Book is unsupported, records indicate that some of the trees are well over 500 years old, and the wood itself far older. It has figured in most of the writings on local history and topography, also in the stories of Eden Phillpotts. Its name probably indicates that a "wistman," or "wiseman," an ancient holy man or hermit, once dwelt in it.—*M. F. Warner*.

1171. DOCTERS VAN LEEUWEN, W. M. In memoriam Dr. S. H. Koorders. Bull. Jard. Bot. Buitenzorg III, 2: 237-241. *Portrait.* 1920.—Dr. Koorders died in November 1919, after more than 35 years in the forest service of the Dutch East Indies. The value of his botanical work for the colonies, and especially for the Buitenzorg Garden, which he enriched by the addition of over 40,000 herbarium specimens, is noted; also his more important publications on the forest flora of Java and other works on the colonial flora. A few notes are added from a more extended biography by E. H. B. BRASCAMP, in *Tectona* 13: 378-504. 1920.—*M. F. Warner*.

1172. DRUCE, G. C. Edward Morgan's Hortus Siccus. Bot. Soc. and Exchange Club British Isles Rept. (1919) 5: 722-724. 1920.—Among the Ashmole MSS. in the Bodleian Library at Oxford are three folio volumes entitled: Hortus Siccus sive Collectio Plantarum ab ipso Eduardo Morgano Facta Ordine Alphabetico, bis Mille Circiter Plantarum Species Exhibens. This collection, which appears to have been begun in 1672, is probably that of the Edward Morgan who lived at Bodesclan, now Bodysgallan, in Wales, who accompanied Thomas Johnson on his expedition into North Wales in 1639.—*G. Claridge Druce*.

1173. [DRUCE, G. C.] Ferdinand Bauer and his landscape drawings. Bot. Soc. and Exchange Club British Isles Rept. (1917) 5: 143-144. 1918.—A collection of water colors by this botanical artist (1760-1829) is noted with brief details of his life.—*G. Claridge Druce*.

1174. [DRUCE, G. C.] John Radcliffe, Bishop of London, as botanist. Bot. Soc. and Exchange Club British Isles Rept. (1917) 5: 142. 1918.—A copy of Sibthorp's *Flora Oxoniensis*, which was bought by Sir William Osler in 1917, contains numerous MS. notes on plants of Ewelme in Oxfordshire. These have been traced to Bishop Radcliffe (1749-1828), and indicate that he had an excellent knowledge of botany.—*G. Claridge Druce*.

1175. [DRUCE, G. C.] Obituaries. Bot. Soc. and Exchange Club British Isles Rept. (1917) 5: 86-93. 1918.—Obituary notices of the following are included: Sarah M. Baker (died 1917?); Robert Braithwaite (1824-1917); Walter Butt (1850?-1917); Charles Thomas Druery (1843-1917); Edward Evans (1846-1917); William Foggitt (1835-1917); Alan Gordon



Harper (1889-1917); Ruth Holden (1890-1917); Samuel Margerison (1857-1917); George Edward Massee (1850-1917); John Platts (1852-1917); Harry Sanderson (1871-1917); Worthington G. Smith (1835-1917).—*G. Claridge Druce*.

1176. [DRUCE, G. C.] *Obituaries*. Bot. Soc. and Exchange Club British Isles Rept. (1918) 5: 349-365. 1919.—Brief biographical notices of the following: John Amphlett (died 1918) by CARLETON REA; James E. Bagnall (1830-1918); Clarence Bicknell (1842-1918) by J. W. WHITE; William Brack Boyd (1831-1918); Edward Fry (1827-1918); Joseph John Geake (1890-1918); Charles Baylis Green (died 1918) by I. M. ROPER; Reginald Philip Gregory (1879-1918); Edward Walter Hunnybun (1848-1918); Ernest David Marquand (1848-1918); T. W. Martyn (died 1918); William Frederick Miller (1834-1918); John Mitchinson (1833-1918); Ethel Sargant (1863-1918) by BEATRICE TAYLOR.—*G. Claridge Druce*.

1177. [DRUCE, G. C.] *Obituaries*. Bot. Soc. and Exchange Club British Isles Rept. (1919) 5: 618-634. 1920.—The following biographical notices are included: Robert Chapman Davie (1887-1919); James M'Andrew (1836-1917); Edward Shearburn Marshall (1858-1919) by F. J. HANBURY; William Osler (1849-1919); Samuel Lister Petty (died 1919); Charles Lancelot Shadwell (1840-1919); Frederick John Smith (1853-1919); Magnus Spence (1853-1919); James William Helenus Trail (1851-1919); William Tuckwell (1829-1919); Cosslett Herbert Waddell (1858-1919); Anthony Wallis (died 1919); George Stephen West (1876-1919). Brief mention is also made of the following: Casimir de Candolle; Prof. Cogniaux; W. G. Farlow; F. Ducane Godman (died 1919); John Hopkinson (died 1919); A. E. Lechmere; Hector Leveillé; James Sawyer (died 1919); Henri Sudre (1862-1918).—*G. Claridge Druce*.

1178. [DRUCE, G. C.] *Robert Dick, of Thurso*. Bot. Soc. and Exchange Club British Isles Rept. (1918) 5: 417. 1919.

1179. [DRUCE, G. C.] *The dates of publication of Curtis's "Flora Londinensis."* Bot. Soc. and Exchange Club British Isles Rept. (1918) 5: 412-414. 1919.—A note supplementing those of W. A. Clark, and Jackson and Pryor in *Journal of Botany* (1895 and 1881 respectively) by giving dates for the first 10 parts of the 6th fascicle (1791-98), covering 54 species. No. lxi-lxvi were issued before the end of 1791, lxvii-lxx before the end of 1794; lxxi probably appeared in 1795, while lxxii did not come out until about 1798.—*G. Claridge Druce*.

1180. [DRUCE, G. C.] [Rev. of: HARVEY GIBSON, R. J. *Outlines of the history of botany*. viii + 274 p. A. & C. Black: London, 1919 (see Bot. Absts. 7, Entry 1596).] Bot. Soc. and Exchange Club British Isles Rept. (1919) 5: 594-596. 1920.

1181. GRAVIS, AUGUSTE. *La morphologie végétale*. [Plant morphology.] Bull. Acad. Roy. Belgique Cl. Sci. 1920: 624-665. 1920 [1921].—There are presented: A history of plant morphology; progress achieved; importance of the problems presented and the efforts to solve them. The author gives a synoptical table of this history.—*Henri Micheels*.

1182. HOFFMAN, G. N. *Mt. Lebanon medicine makers—the Shakers*. Pharm. Era 53: 197-198, 229-231. 4 fig. 1920.—Their medicinal preparations from native plants, begun as early as 1825, at one time amounted to 75 tons per year. They devised the vacuum process of distillation about 1830, and cultivated drug plants at an early date. The growing and sale of garden seeds was another important industry.—*Neil E. Stevens*.

1183. J[ACKSON], B. D. *James William Helenus Trail*. Proc. Linn. Soc. London 132: 49-51. 1921.—A sketch of the life and work of Professor Trail (1851-1919), of Aberdeen, is given.—*M. F. Warner*.

1184. J[ACKSON], B. D. *John Hopkinson*. Proc. Linn. Soc. London 132: 43-45. 1921.—John Hopkinson (1844-1919), actively engaged in business as a piano manufacturer, gave his leisure to scientific pursuits, and for years specially studied graptolites. At the age of 15 he began his herbarium, which in later life he gave to the St. Albans local museum. He was a



member of numerous scientific societies and one of the founders of the Watford, afterwards Hertfordshire, Natural History Society, of which he was an active officer until his death.—*M. F. Warner.*

1185. [JACKSON, B. D.] *Methods of botanical illustration during four centuries.* Proc. Linn. Soc. London 132: 7-9. 1921.—A lecture on illustration, covering: (1) Surface design, including the "block books" and the fine woodcuts of early herbals; (2) copper plate—etching and engraving; (3) reproduction by chemical agency such as photography, lithography, and the like.—*M. F. Warner.*

1186. J[ACKSON], B. D. Prof. George Stephen West. Proc. Linn. Soc. London 132: 52-53. 1921.—Prof. West (1876-1918) of Birmingham, the leading authority upon freshwater algae of the United Kingdom, was the son of the prominent algologist William West, with whom he jointly published many works, also writing independently many papers and 2 books in his special subject: *British Freshwater Algae* (1904), and *Algae* (1916).—*M. F. Warner.*

1187. J[ACKSON], B. D. Rev. Edward Shearburn Marshall. Proc. Linn. Soc. London 132: 45-46. 1921.—A brief sketch is given of the life and botanical work of E. S. Marshall (1853-1918).—*M. F. Warner.*

1188. J[ACKSON], B. D. William James Tutchet. Proc. Linn. Soc. London 132: 51-52. 1921.—Tutchet was born 1867 and died in March, 1920. He was Superintendent of the Botanical and Forestry Department of Hongkong, where he had spent nearly 30 years, giving much time to botanical exploration. In 1912 he collaborated with S. T. Dunn in the publication of the *Flora of Kwantung and Hongkong*.—*M. F. Warner.*

1189. KRONFELD, E. M. *Sagenpflanzen und Pflanzensagen.* [Legendary plants and plant lore.] 96 p., 23 fig. Theod. Thomas: Leipzig, [1919.].—The book includes popular legends and literary associations of plants in connection with wars and deeds of heroism.—*Neil E. Stevens.*

1190. MALTE, M. O. James Melville Macoun, C. M. G. Canadian Field Nat. 34: 38-40. *Portrait.* 1920.—Macoun was born in Belleville, Ontario, in 1862, the son of Professor John Macoun; he died January 8, 1920. The present article brings out especially Macoun's work as a field naturalist and explorer.—*M. F. Warner.*

1191. MARIBOE, CARL. Leopold Helweg. Tidsskr. Landøkonomi 1920: 338-393. *Portrait.* 1920.—Leopold Hans Andreas Helweg was born in Copenhagen March 2, 1851, and died August 6, 1920. In 1886 he became director of the investigations on root crops of the Danish society for the improvement of cultivated plants; when the experimental work was taken over by the government in 1893, Helweg continued as director until his death. He wrote many articles for agricultural papers, and a monograph of the varieties of carrot. From 1886 to 1901 he was editor of *Gartner-Tidende*; he edited the *Nordisk Illustreret Havebrugsleksikon* (Scandinavian illustrated gardeners' dictionary), and in 1895 published a work on plant forcing.—*M. F. Warner.*

1192. R[ENDLE], A. B. William Robert Carver. Jour. Botany 56: 334-335. 1918.—Carver (1860-1918) was for many years departmental clerk in the cryptogamic section of the Department of Botany of the British Museum (Nat. Hist.), and had an extensive knowledge of seaweeds.—*Neil E. Stevens.*

1193. RICALTON, JAMES. *Famous and interesting trees.* Amer. Forestry 27: 216-224. 10 fig. 1920.—Banyan trees (*Ficus religiosa* or *Ficus indica*), the olive, rubber trees, and others are described.—*Chas. H. Otis.*

1194. SALMON, C. E. Anthony Wallis. Jour. Botany 57: 347-348. 1919.—Wallis (1879-1919) was inspector in the Education Department. While at Cambridge he compiled *The*



Flora of the Cambridge District for Marr's Natural History of Cambridgeshire, and later communicated new localities and rare plants to Druce's Flora of Cambridgeshire.—*Neil E. Stevens.*

1195. SMITH, A. L. William Gilson Farlow. *Proc. Linn. Soc. London* 132: 38–39. 1921.—A brief sketch of Prof. Farlow (1844–1919), commenting on his cordial relations with British botanists, is presented.—*M. F. Warner.*

1196. STEELE, J. G. History of the California College of Pharmacy. *Pacific Pharm.* 12: 78–79, 100–104, 129–131, 151–157, 179–182. 1918.

1197. STURMER, J. W. 1820—A bit of history. *Western Druggist* 42: 110–112. 1920.—A comparison of apothecaries of today with those of one hundred years ago is made.—*C. M. Sterling.*

1198. VELU, H. Les fleurs—leur rôle social. [The function of flowers in society.] *Bull. Soc. Hort. Maroc* 8: 50–59. 1920.—The significance of exhibitions and floral feasts and the possibilities of Morocco as a source of medicinal and perfume plants are discussed, with extracts from the legendary and literary lore of flowers.—*M. F. Warner.*

1199. VINES, S. H. Simon Schwendener. *Proc. Linn. Soc. London* 132: 47–49. 1921.—Schwendener was born February 10, 1829, and died May 10, 1919. He began his university course at Geneva under Alphonse de Candolle, and graduated at Zurich under Oswald Heer in 1856. Coming into relations with Naegeli, Schwendener turned his attention to the microscopical anatomy of plants. His "contribution to the right understanding of Lichens is his first claim to remembrance as a botanist. His second claim is that he founded and prosecuted to some extent, the study of physiological anatomy." In 1879 he became professor of botany at Berlin, where he remained to the end of his life, and inspired a number of his students to research in physiological anatomy.—*M. F. Warner.*

1200. YURIN VASSIL, P. K sud'be Tingutinskogo s.-kh. uchastka v sviazi s vozrozhdeniem sel'skogo khoziaistva na iugo-vostoke Rossii. [The fate of the Tingutinski experimental grounds.] *Narodnoe Khoziaistvo* [Moscow] 1920: 69–70. 1920.—Some very important work, particularly on irrigation, was carried on in the pre-war period on the Tingutinski agricultural grounds, in the former province of Saratov, comprising some 5416 acres. These are now in a lamentable condition due to the circumstances of the civil war. However, measures already have been taken for their reconstruction, and great developments in the future are expected.—*M. Shapovalov.*

## BOTANICAL EDUCATION

C. STUART GAGER, *Editor*

ALFRED GUNDERSEN, *Assistant Editor*

(See also in this issue Entries 1244, 1393, 1395, 1607)

1201. ALBURTIS, S. S. How school children study trees. *Amer. Forestry* 27: 291–298. 14 fig. 1921.

1202. BEARD, J. G. The business of teaching. *Druggists Circ.* 65: 123–126. 1921.—The author discusses the importance of more and better educational training, and continued scientific research in pharmacy.—*C. M. Sterling.*

1203. BÖHMER, J. G. Landbrukshöiskolens skogbruksavdeling. [Forestry division of the agricultural high school, Norway.] *Tidsskr. Skogbruk* 29: 73–78. 1921.—Revised curriculum, in forestry, according to the law of July 23, 1919, is presented for the 3-year course at the Norwegian School of Agriculture.—*J. A. Larsen.*

1204. BORGMANN, W. Ausbau des forstlichen Hochschulunterrichts an der Hessischen Landesuniversität Giessen. [Expansion of academic forestry course at the University of Giessen.] *Forstwiss. Centralbl.* 43: 62-69. 1921.—Even before the war the movement was inaugurated to combine the forest schools of Tübingen, Giessen, and Karlsruhe in 1 school at Heidelberg. Since the war, this plan has been abandoned, but Württemberg and Baden have combined their courses, given at Freiburg. This location is not convenient for Hesse, and it has been decided to maintain and enlarge the course at Giessen. The article appeals for oral and material support from all interested persons and organizations.—*W. N. Sparhawk.*

1205. COOPER, ZADA M. Report of the committee to investigate "short term," correspondence, summer, and other similar courses. *Pacific Pharm.* 12: 267-272. 1919.

1206. FABRICIUS. [Rev. of: LINSBAUER, KARL. WIESNER, JULIUS. *Elemente der wissenschaftlichen Botanik*. I Band. Anatomie und Physiologie der Pflanzen. 6th ed., 412 p., 303 fig. Alfred Hölder: Berlin and Leipzig, 1920.] *Forstwiss. Centralbl.* 43: 75-77. 1921.—The present is an entirely revised edition. Fabricius expresses the wish that botanists pay a little more attention to trees instead of confining their discussions and illustrations almost entirely to crop or weed plants. For instance, the discussion of the influence of light upon seed germination in *Ranunculus*, *Allium*, or *Pinguicula*, could have been illustrated just as well with results of research on forest-tree seeds.—*W. N. Sparhawk.*

1207. GATHERCOAL, E. N. Bacteriology in pharmacy colleges. *Druggists Circ.* 64: 171-172. 1920.

1208. GRAVIS, A. *Éléments de morphologie végétale*. [Elements of vegetable morphology.] 16 X 26 cm., 204 p., 32 pl. H. Vaillant-Carmanne: Liège, 1920.—This text book is intended for use in a course in plant morphology based on the study of representative types. It comprises 3 main parts. The 1st, "Notions of Cytology," deals with cells—their structure, physiological responses, and origin by division. In the 2nd part, "Principal Types of Vegetable Organization," representative types of the great plant groups are taken up with reference to their organs of vegetation, asexual propagation, sexual reproduction, and spore production. This part includes also a synthetic survey of the evolution of the plant kingdom. In the 3rd part, "Study of Angiospermous Plants," the organography, anatomy, and classification of flowering plants are considered in somewhat greater detail. The book is illustrated with 32 plates of diagrammatic figures. An unusual feature is a collection of quotations from the writings of eminent men on the subjects of science, scientific method, study, etc.—*L. W. Sharp.*

1209. HEPLER, J. R. Teaching systematic olericulture. *Proc. Amer. Soc. Hort. Sci.* 17: 169-172. 1920 [1921].—The method of study and presentation of a college course in systematic vegetable gardening is discussed.—*H. A. Jones.*

1210. RUDD, WORTLEY F. Bacteriology in the two year course. *Druggists Circ.* 65: 127-128. 1921.—Arguments are presented in favor of a short course in bacteriology intended to enable pharmacists to take a more active part in various public health activities.—*C. M. Sterling.*

1211. SCHNEIDER, ALBERT. A full-time four-year college of pharmacy course. *Pacific Pharm.* 12: 185-188. 1918.—An outline of studies is presented for a full 4-year course in pharmacy and suggestions on teaching methods and equipment of teachers.—*C. M. Sterling.*

1212. SCHÜPFER. [Rev. of: KÖLLNER, F. *Forstwirtschaft*. 84 p., 26 fig. Paul Parey: Berlin, 1921.] *Forstwiss. Centralbl.* 43: 189-190. 1921.—This is a brief elementary forestry textbook for the use of agricultural schools. Schüpfer points out several misstatements.—*W. N. Sparhawk.*



1213. SVESSENGUTH, KARL. [Rev. of: KRAEPELIN, KARL. *Einführung in die Biologie. (Introduction to biology.)* 4th ed. B. G. Teubner: Leipzig and Berlin, 1919.] Forstwiss. Centralbl. 43: 73-74. 1921.—A most excellent and well illustrated textbook for the higher schools, as well as for self-instruction. The physiological side has been emphasized more than in previous editions, and chapters on heredity, genetics, and other subjects have been added.—*W. N. Sparhawk.*

1214. SVESSENGUTH, KARL. [Rev. of: MIEHE, H. *Allgemeine Biologie. (General biology.)* Vol. 130 of the series, "Aus Natur und Geisteswelt."] Forstwiss. Centralbl. 43: 74-75. 1921.

1215. WELLS, B. W. A method of teaching the evolution of the land plants. *Torrey* 21: 45-47. 1 pl. 1921.—The comparative method constitutes the only vital approach to the story of plant evolution. The types must be brought together so that they can be automatically compared. The plate, which is the work of a freshman student, illustrates how this may be done graphically. The life cycles are drawn concentrically, the lowest in the center. The significant stages are marked out by radii. Each circle is filled in by the student as he finishes his study of the type. All the evolutionary changes in a given structure are seen by following its radius outward.—*J. C. Nelson.*

## CYTOLOGY

GILBERT M. SMITH, *Editor*

GEORGE S. BRYAN, *Assistant Editor*

(See in this issue Entries 1296, 1297, 1298, 1300, 1370, 1515)

## FOREST BOTANY AND FORESTRY

RAPHAEL ZON, *Editor*

J. H. HOFMANN, *Assistant Editor*

(See also in this issue Entries 1193, 1203, 1204, 1212, 1547, 1559, 1561, 1565, 1601, 1602, 1677, 1682)

1216. ANONYMOUS. *Das Reichsforstgesetz.* [The forest law for the German Empire.] Forstwiss. Centralbl. 43: 37-39. 1921.—This is the text of the proposed Imperial forest law formulated by the Imperial Forestry Council (Reichsforstwirtschaftsrat) in September, 1920. It is designed to make the practice of forestry compulsory on all forest lands in the empire, regardless of ownership. Administration of the laws, as well as the details of the laws themselves, are left for the most part to the individual states.—*W. N. Sparhawk.*

1217. ANONYMOUS. *Forestry in relation to agriculture.* *Agric. News* [Barbados] 20: 34. 1921.—The author discusses the differences between forestry and agriculture, pointing out where the two overlap. Forestry in tropical America, now and for some time to come, should proceed only on lines of organization, survey, and judicious cutting, and to a lesser degree along those of reforestation, mensuration, high finance, and working plans.—*J. S. Dash.*

1218. ANONYMOUS. *Indberetning om det Norske skogvesen.* [Report of the Norwegian Forest Service.] *Indberet. Norske Skogv.* 1919: 1-130. 1921.—A very complete and comprehensive report of the Director for the calendar year 1919 is presented, setting forth all forest activities in the different districts. The net receipt was 4,624,685 kroner; the total cut 378,918,325 cubic meters; there were 108 forest fires which covered about 200 hectares and caused a damage of 21,446 kroner. The personnel consists of 3 inspectors, 2 assessors, 24 assistants and 504 rangers or "Vogtere." The service planted 552,977 trees.—*J. A. Larsen.*

1219. ANONYMOUS. *Lieferung von Waldsamen an die Entente.* [Delivery of forest seeds to the Entente.] *Deutsch. Forstzeitg.* 36: 220. 1921.—Germany is required to deliver to the Entente countries stocks of forest-tree seeds and plants over a period of some 10 years. In the spring of 1921 the deliveries to France, Belgium, and Italy aggregate 6700 kgr. of pine seed and 2100 kgr. of spruce seed, besides considerable quantities of ash seed.—*W. N. Sparhawk.*

1220. ANONYMOUS. *Lumber used in the motor vehicle industry.* *Sci. Amer. Monthly* 3: 274-275. 1921.

1221. ANONYMOUS. *Satzung des Verbandes "Bayerische Waldversicherung."* [Constitution of the association "Bavarian Forest Insurance."] *Forstwiss. Centralbl.* 43: 31-37. 1921.—The text of the constitution is given.—*W. N. Sparhawk.*

1222. ANONYMOUS. *Steigerung des Ertrages der deutschen Waldungen.* [Increasing the yield of German forests.] *Deutsch. Forstzeitg.* 36: 125-126. 1921.—The suggestion, made at the Brussels financial conference, that the production of German forests could be increased, is impossible of fulfillment, because Germany lost 1.5 million hectares of forest by the peace treaty and is already cutting as much as the annual growth, or more. In 1912, 47.8 million cubic meters of timber were cut,  $\frac{2}{3}$  of which was construction material (Nutzholz); the remaining forests cannot yield more than 40 million cubic meters without diminishing the forest capital.—*W. N. Sparhawk.*

1223. ANONYMOUS. *The forest reserves of Trinidad and Tobago.* *Agric. News [Barbados]* 19: 374. 1920.—A report by C. S. ROGERS, Conservator of Forests, is discussed. The policy of the Government is to reserve certain areas for (a) the protection of the water supply, the preservation of favorable climatic influences, and the maintenance of suitable breeding places for the bird and insect friends of agriculture; and (b) the production of timber and other forest products necessary for the welfare of the community.—*J. S. Dash.*

1224. ANONYMOUS. [Rev. of: COPPET, M. DE, UND A. HENNE. *Allgemeine Orientierung über Kriegswirtschaftliche Massnahmen betreffend Waldwirtschaft, Nutzungen, und Holzverkehr 1914-1919.* (Wartime measures dealing with forest management, utilization, and timber trade.) Bern, 1920.] *Forstwiss. Centralbl.* 43: 78-79. 1921.—The book recounts wartime regulations in Switzerland and their effect on Swiss forests and economic life. The war changed Switzerland from a wood-importing country to a wood-exporter, but in 1920 she again became an importer. In 1914 imports of wood exceeded exports by 20,230,000 francs, while in 1918 exports led by 117,970,000 francs. In 1913 the net import, in volume, of timber, lumber, and firewood amounted to 557,513 cubic meters, while in 1916, the year of greatest export (by volume), the net export was 883,689 cubic meters.—*W. N. Sparhawk.*

1225. BILLWILLER, R. *Über die Föhnsturmkatastrophe vom 4/5 Januar 1919 im Berner Oberland.* [The catastrophe caused by the southerly winds of January 4 and 5, 1919, in the higher altitudes of the Bern region.] *Schweiz. Zeitschr. Forstw.* 72: 2-11. 1 map. 1921.—A contribution by Billwiller and observations by VON GREYERZ are presented. The damage done by this storm was greater than any recorded for more than a decade. The damaged timber was about 90 per cent uprooted and 10 per cent broken, and was thrown in all directions in some localities and in a northeasterly direction in others. A total of 807,550 cubic meters was windthrown, and about 200 hectares were reduced to the non-productive state.—*J. V. Hofmann.*

1226. CIESLAR, A. *Über die Erntezeit der Früchte der gemeinen Esche (Fraxinus excelsior L.).* [Concerning the time for collecting seed of the common ash (Fraxinus excelsior).] *Centralbl. Gesam. Forstw.* 46: 90-100. 1920.—Despite many years of silvicultural experience with ash, there is still comparatively little known regarding the best time and methods of collecting, storing, and planting the seed. In nature, ash seed does not generally germinate until the 2nd year. The author experimented to ascertain chiefly whether it could not be germinated the 1st year after ripening. Seed was collected Sept. 17, Nov. 17, Jan. 8, and Feb. 28.



That gathered on the first 2 dates was handled by 3 methods: (1) Sowing immediately in seed beds; (2) storing in moist sand until sowed in the spring; (3) hanging up in bags in the store house until sowed in the spring. The seed gathered in January was handled by the 2 last-mentioned methods and that gathered in February only by the last method. In the 1st spring (1918) germination took place and plants developed only from the September seed that had been either sowed directly or stored in sand. In all other cases germination did not take place until the 2nd spring (1919), when all the remaining classes of seed germinated, the percentage of germination increasing the later the date of collecting the seed.—*R. H. Weidman.*

1227. DAHL, A. L. Some special uses of redwood. *Sci. Amer.* 124:286, 297. 4 fig. 1921.

1228. DOCK, H. Die Stereophotogrammetrie und ihre Bedeutung für die Forstwirtschaft. [Stereophotogrammetry and its application in forest management.] *Centralbl. Gesam. Forstw.* 46: 65-90. 1920.—The author discusses in detail the phototopographic method of surveying, including a discussion of the theory of the method, description of the instruments, and an illustration of the use of the method on an actual area. The essential field instrument is the phototheodolite and the office instruments are the stereokomparator and the stereoautograph. The last is a drafting instrument of complicated mechanism and is evidently a more recent development and refinement in the office work of the camera surveying method. The author is an engineer and the article is purely in the domain of engineering.—*R. H. Weidman.*

1229. ECKSTEIN, FRITZ. Ueber die Lebensweise von *Thanasimus* (*Clerus*) *formicarius* Latr. [Notes on the life history of *Thanasimus* (*Clerus*) *formicarius* Latr.] *Forstwiss. Centralbl.* 43: 57-62. 1921.—But little has been written concerning the life history of this insect, which is generally considered to be of great importance as an enemy of the bark beetles, especially *Myelophilus piniperda*. This paper outlines the life cycle of the beetle (approximately 1 year), and compares it with that of *Myelophilus*. The increase is not very rapid, since the female lays only 20 or 30 eggs, and the larvae develop more slowly than those of *Myelophilus* or the other bark beetles (*M. minor*, *Hylastes ater*, *Tomicus typographus*, and others). The latter reproduce much more rapidly. It is concluded that *Clerus* is of comparatively little importance in combating the bark beetles, although it helps to keep their numbers in check.—*W. N. Sparhawk.*

1230. EHRHORN, E. M. Report of the Chief Plant Inspector. Rept. Bd. Commissioners Agric. and Forest. Hawaii 1919-1920: 75-85. Pl. 16-22. 1921.—Packages containing plants and plant products to the number of 579,207 were inspected for insect and fungous diseases. Presence of citrus canker (*Pseudomonas citri*) in Honolulu is reported.—*J. M. Westgate.*

1231. ENDRES. Die Bayerische Waldversicherung. [Bavarian forest insurance.] *Forstwiss. Centralbl.* 43: 1-6. 1921.—The new forest insurance association, formed in Bavaria in 1920, embodies some new principles which it is hoped will make insurance of forests more practicable. Private individuals, as such, cannot insure their forests; they must do so through the medium of their communes or through associations. The business is limited to fire insurance at first, but it is planned later to cover losses by insects, diseases, wind, etc. Insurance applies to the entire forest property in Bavaria of each owner who takes out a policy, and premiums are determined on a flat area basis, regardless of species or age of stand. Indemnities are limited to a value of not to exceed 1000 marks per hectare, unless the owner has paid extra premium for a higher insurance. The insurance association has adopted another feature to encourage forest loans. It contracts with the lender to protect him against losses due either to fire or to felling of timber contrary to agreement by the owner, and thereby makes his loan much more secure.—*W. N. Sparhawk.*

1232. ENDRES. [Rev. of: ENGLER, ARNOLD. Untersuchungen über den Einfluss des Waldes auf den Stand der Gewässer. (Influence of forest cover on water supplies.) *Mitteil. Schweiz. Zentralanst. Forst. Versuchsw.* 12: 1-626. 58 fig. 1919 (see Bot. Absts. 9, Entry 710).] *Forstwiss. Centralbl.* 43: 114-119. 1921.—Endres outlines Engler's results on the 2 areas

(Sperbelgraben and Rappengraben), and points out several weak points in the way the project was carried out; for instance, (1) the 2 areas were in several respects not entirely comparable, and (2) the lack of satisfactory records of the actual amount of precipitation on the experimental areas. He does not feel entirely convinced by Engler's figures, but believes that no amount of exact measurement can absolutely solve the question of the relation between forests and water.—*W. N. Sparhawk.*

1233. FABRICIUS. [Rev. of: BERTOG, HERMANN. *Die Beschaffung des Kiefernnsamens insbesondere seine Selbstgewinnung.* [The gathering of pine seed.] 124 p., 8 fig. J. Neumann: Neudamm, 1920.] *Forstwiss. Centralbl.* 43: 71-72. 1921.—This book, based on the results of research by CIESLAR, SCHOTT, ENGLER, KIENITZ, HAACK, and DENGLE, is written especially for private foresters and forest owners. It brings out very clearly the desirability of collecting one's own seed, instead of relying on seedsmen, both because of the uncertainty as to origin of commercial seed, and because such seed may have been handled in such a way as to seriously affect its quality. Figures are given to show that self-collected seed costs much less than that obtained from dealers.—*W. N. Sparhawk.*

1234. FABRICIUS. [Rev. of: BORGMANN, WILHELM. *Die Begründung und Erziehung von Holzbeständen.* [Formation and tending of timber stands.] 215 p., 35 fig. Paul Parey: Berlin, 1920.] *Forstwiss. Centralbl.* 43: 27-29. 1921.—The book is not a text book on silviculture, but is an excellent popular treatise for the use of forest owners who are not technically trained in forestry.—*W. N. Sparhawk.*

1235. FABRICIUS. [Rev. of: SOLLA, R. E. *Holzgewächse zur Winterszeit. Anleitung zum Bestimmen entlaubter Holzgewächse.* [Woody plants in winter. Guide for the identification of woody plants in the absence of their leaves.] 42 p., 50 fig. Theodor Fischer: Freiburg i. Br., 1920.] *Forstwiss. Centralbl.* 43: 79. 1921.—The book is simple and usable, and contains keys for the identification of 56 species of deciduous trees and 80 species of shrubs of central and southern Europe.—*W. N. Sparhawk.*

1236. FABRICIUS. [Rev. of: WIEBECKE, VON. *Der Dauerwald in 16 Fragen und Antworten für den Gebrauch im Walde.* (The "continuous forest.") Stettin.] *Forstwiss. Centralbl.* 43: 195-198. 1921.—Von Wiebecke's "Dauerwald" is the same silvicultural system as that used by von Kalitsch in Bärenthorn. In spite of all the claims made for it, Fabricius points out that it has certain disadvantages as compared with the clear cutting systems, and that it is essentially only a selection system under a new name.—*W. N. Sparhawk.*

1237. FABRICIUS. [Rev. of: WILDA, HERMANN. *Das Holz, Aufbau, Eigenschaften und Verwendung.* (Wood, its structure, properties, and use.) 154 p., 109 fig. Walter de Gruyter & Co.: Berlin and Leipzig, 1920.] *Forstwiss. Centralbl.* 43: 190-191. 1921.—This book attempts to give in a form adapted for popular use all the essential facts about wood and its uses. In attempting to condense the material, the author has sacrificed much in the way of completeness and accuracy, especially on the scientific side.—*W. N. Sparhawk.*

1238. FRIES, THORE C. E. *Björkskogsgränsens höjdläge inom Tromsø Amt.* [Upper limit of birch in Tromsø district, Norway.] *Tidsskr. Skogbr.* 29: 48-72. 1921.—An examination of the causes in the variation of the upper limit of birch, *Betula odorata*, at the northern limit of its distribution.—*J. A. Larsen.*

1239. FROST, S. *Forestry from the air.* *Amer. Forestry* 27: 278-280. 2 fig. 1921.—The author concerns himself with the use of airplanes in forest mapping, reconnaissance, and other operations in a Canadian forest.—*Chas. H. Otis.*

1240. GOOSSENS, M. *Notes sur un peuplement de parasoliers aux environs de Ganda-Sundi.* [Note on a parasol tree association in the neighborhood of Ganda-Sundi.] *Bull. Agric. Congo Belge* 11: 74-79. Fig. 17-18. 1920.—The parasol tree (*Musanga Smithii*) grows very



readily in forest clearings and abandoned plantations. It has been recommended as a shade tree for cacao plantations but has not proved suitable. Several other uses are suggested; it is particularly suitable as raw material for the manufacture of paper, and would probably prove remunerative if cultivated for this purpose.—*E. M. Doidge.*

1241. HARRER, FR. *Harzgewinnung in Amerika*. [Resin production in America.] *Forstwiss. Centralbl.* 43: 130-137. 1921.—The methods of harvesting and distilling resin in Florida are briefly described, with old statistics of production and exports of turpentine and rosin. It is concluded that the U. S. A. will in a short time be unable to more than supply its own requirements. Germany could theoretically supply her own needs for turpentine and pine oil, but not for rosin, if the question of cost were left out of consideration. Unless substitutes can be derived from coal tar distillation, rosin supplies must be sought in other countries, especially the tropics.—*W. N. Sparhawk.*

1242. HEES. *Klasseneinteilung des Nadel-Stammholzes*. [Classification of conifer logs.] *Deutsch. Forstzeitg.* 36: 199. 1921.—Softwoods, like hardwoods, should be classified according to diameters instead of by the total cubic volume of the piece, regardless of size. With the present system, short thick sticks suitable for lumber are often classed with long slender ones suitable only for mine props.—*W. N. Sparhawk.*

1243. HEIBERG, Axel. *Det Norske Skogselskap*. [The Norwegian forestry association.] *Tidsskr. Skogbr.* 28: 187-200. *Pl. 10*. 1920.—The author sums up the results of an inspection trip of the forest plantations on the west coast of Norway near Stavanger and Bergen. These plantations are up to 50 years old and consist of Norway spruce, Scotch pine, Douglas fir, noble fir, oak, and birch. The soil is generally excellent for reforestation and the local sentiment in favor of this work very good, thanks to the energetic leadership of a few men. Private owners are required by law to cut according to the State's dictum and to replant denuded tracts.—*J. A. Larsen.*

1244. HOHENADL, W. *Das Versuchswesen und das wirtschaftliche Prinzip in der Forstwirtschaft*. [Research and the economic principle in forest practice.] *Forstwiss. Centralbl.* 43: 50-57, 84-100, 137-151. 1921.—In view of the recent suggestion that forest research in Bavaria be divorced from the forest schools and provided for in a separate state research institute, the author reviews briefly the development of forest research in Bavaria. When first organized under the leadership of GANGHOFER in 1875, it was independent of the schools, and the economic purpose was emphasized, namely, to determine scientific principles and to devise ways for applying them in forest practice, with the object of insuring a continuous production of maximum values with a minimum of outlay. The reorganization in 1882 transferred research to the forest department of the University of Munich, where it has since remained, and provided for a combination of the purely research objective with training in scientific forestry. To again set research apart by itself would surely not help to secure the application of its findings in actual forest practice, for even now many of the principles evolved by research are far from being assimilated by the practitioners. Forestry has not kept pace with other industries in improving its technique and organization of work to meet changing conditions, but has practically stood still. The author reviews the development of industry from the phase of the individual handworker to the present-day phase of large factory units with division of labor and dependence on the engineer or technician, not only for developing mechanical methods and processes but also for scientifically organizing the work and personnel. All such engineering work is based very largely on mathematical research,—cost accounting, time studies, measurements of various sorts. Forestry has lagged behind because of the forms of ownership of forests: small peasant owners; state and communes not interested solely in the most profitable management; and large private owners whose management is guided by tradition or by a desire to maintain game preserves. Foresters themselves have been very conservative and slow to adopt new ideas.—The chief problems for forestry research are problems of measurement (of trees, stands, forest sites and site factors), and of the correlation of these measurements with different conditions of growth or different methods of management.

These studies are necessary in addition to fundamental research, because the long period required to grow timber and the great diversity of conditions require the gradual accumulation of the results of actual experience by many investigators, and their results must be expressed in the same terms and must be comparable. The investigator must work in the forest and in closest touch with practitioners, because it is as important that the scientific principles be applied in actual practice as it is to discover the principles. It is desirable that the research institution be responsible for the economic management of a demonstration forest, since this will help to keep science and practice closely tied together.—*W. N. Sparhawk.*

1245. HOLM, C. J. *Et Forsøg med fremmede Løvtraer.* [Experiments with exotic deciduous trees.] Forst. Forsøgsv. Danmark 5: 293-300. 1920.—Experimental plantations were begun on Seeland, Denmark, in 1912. The species most extensively tried were *Quercus rubra*, *Q. palustris*, and *Betula odorata*. Tests were also made of *Quercus coccinea*, *Betula lutea*, *B. Maximowiczii*, *Acer Negundo*, *Fraxinus americana*, *Ceridiphyllum japonicum*, *Acanthopanax ricinifolium*, and *Albizzia Julibrissin*. The precipitation approaches 2 inches per month in June, July, and August; April has 8 and May 1 days of frost. The results are discouraging. The oaks suffered heavily from spring frost and are practically all dead; *Betula lutea*, *Acer Negundo*, and *Fraxinus americana* are failures, but *Betula odorata* and *B. Maximowiczii* are very promising.—*J. A. Larsen.*

1246. HÖNLINGER, H. *Zum Methodenstreit in der forstlichen Statik.* [On the controversy over methods of forest statics.] Centralbl. Gesam. Forstw. 46: 100-111, 144-151. 1920.—The author concerns himself chiefly with a refutation of Dr. NEUBAUER's conception of the theory of highest interest on capital value of the forest (Reinertragslehre), which appeared in the above journal for 1918. The forest finance and mathematics of valuation formulae are analyzed in detail to prove the author's position.—*R. H. Weidman.*

1247. HUTTANUS. *Waldverwüstung.* [Forest destruction.] Deutsch. Forstzeitg. 36: 157, 159. 1921.—Most of the forests near Cologne are in private hands, and practically all are being laid waste, with no provision for a future stand. Only strict state control of cuttings can save what remains.—*W. N. Sparhawk.*

1248. JOLYET, A. *Repeuplement artificiel dans une station de friche après exploitation à blanc étoc d'un peuplement de pin noir.* [Artificial reforestation after clear cutting of black pine.] Bull. Trimest. Soc. Forest. Franche-Comté et Belfort 13: 273-277. 1920.—Black pine is better adapted than any other species to thin-soiled, calcareous wastes at low altitudes in eastern and northeastern France. Natural regeneration is, however, very difficult, and artificial regeneration after each rotation very expensive. It is therefore suggested that clear cuttings, which are usually resorted to, be followed by the planting of Douglas fir (green variety), hornbeam, and black locust, with an occasional sycamore maple. Planting holes should be made in rows 1.5 m. apart each way. A Douglas fir should be planted in every 6th hole in every 6th row,—about 120 per hectare. In each of the other holes should be planted a tuft of 4 trees composed of 2 hornbeams and 2 locusts. A stand of this sort is well adapted to the site and will perpetuate itself indefinitely by a combination of sprouts and seedlings.—*S. T. Dana.*

1249. JUDD, C. S. *Report of the Superintendent of Forestry.* Rept. Bd. Commissioners Agric. and Forest. Hawaii 1919-1920: 19-45. Pl. 1-12. 1921.—Emphasis is laid on the necessity of forest protection and forest extension (total of 71,641 trees of 37 species transplanted to 11 forest reserves throughout the Islands); methods of reducing fire menace; and Arbor Day activities.—*J. M. Westgate.*

1250. KIERULF, T. *Fra en skogtur i Normandie og litt om de Franske bøgeskoge.* [A trip to Normandy and a little about the French beech forests.] Tidsskr. Skogbr. 29: 10-22. Pl. 1-7., fig. 1. 1921.—The author presents a description of a 10,607 hectare beech and oak forest at Lyons, near Rouen, France, including silviculture and management.—*J. A. Larsen.*



1251. KOBAYASHI, J. Paper making in Japan. Amer. Forestry 27: 320-321. 2 fig. 1921.

1252. KÜNKELE. Hilfstafel zur Zuwachserhebung. [Graphic chart for determining increment.] Forstwiss. Centralbl. 43: 81-83. Chart 1. 1921.—A chart giving the per cent of increment of basal area, height, volume, and value of individual trees, is illustrated and discussed briefly. The determination of growth per cent of individual trees is particularly important now that silviculture is turning strongly toward the selection system.—W. N. Sparhawk.

1253. KURTH. Fichtensaat oder -pflanzung? [Spruce seeding or planting?] Deutsch. Forstzeitg. 36: 147. 1921.—Spruce stands grown from plantations do not, because of comparatively wide spacing, produce long slender poles, especially bean poles, which are in great demand. Therefore about 10 per cent of the area restocked with spruce each year should be seeded instead of planted.—W. N. Sparhawk.

1254. L. [Rev. of: ACHTERRATH, HELMUT. Deutsche Rohholzwirtschaft während des Krieges und in der Übergangszeit. (German timber supply during the war and in the transition period.) Frankfurt.] Forstwiss. Centralbl. 43: 29-30. 1921.—Achterrath discusses the timber situation before the war, measures adopted to insure supplies for the army and civil use during the war, and the outlook for the future, with especial reference to future sources of imports.—W. N. Sparhawk.

1255. LONGVILLE, A. Logging by electricity. Sci. Amer. 124: 285. 2 fig. 1921.

1256. MAHOOD, S. A., AND ELOISE GERRY. The production of American storax. Druggists Circ. 65: 3-5. Fig. 1-7. 1921.—Experiments were carried on to find a supply of storax to take the place of Asiatic storax which was shut off by the World War. Collections of material for investigation were made from *Liquidambar styraciflua* growing near Elliott City, Louisiana, from June 10 to Nov. 14. Methods of tapping the trees and collecting the gum are described. Chemical analyses show that American storax compares very favorably with that of Asiatic origin. A microscopic examination of the wood shows that the storax is produced in the wood formed after the tree has been wounded. The yield of storax is in proportion to the number and size of the ducts thus developed.—C. M. Sterling.

1257. MILLER, E. E. Black locust reclaims washed lands. Amer. Forestry 27: 252-253, 264. 4 fig. 1921.

1258. MÜNCH, ERNST. Naturwissenschaftliche Grundlagen der Kiefernharznutzung. [Scientific bases of production of pine resin.] Arbeit. Biol. Reichsanstalt Land- u. Forstw. 10: 1-140. 20 fig. 1919.—The scarcity of naval stores in Germany during the war led to the utilization of the resin of *Pinus sylvestris* as a new industry. Münch attempts to place the technique of tapping on a scientific basis. The careful study comprises the following points: Microscopic structure of the resin duct; distribution and number of ducts with relation to width of annual ring; structure of the system of ducts throughout the bole; physiology and mechanics of the formation and flow of resin upon tapping; formation and rôle of pathological ducts; influence of climate, site, age, crown development of tree, method of tapping, and intervals between tapping on yield. The yield may vary up to 400 per cent. The possible yield per hectare per year is 1000-1250 kgr.—E. P. Meinecke.

1259. NEUMANN. Die Kiefer-Dauerwaldwirtschaft. [The continuous management system with pine.] Deutsch. Forstzeitg. 36: 189-193. 1921.—The author has visited the Barenthorn forest in Anhalt, where von KALITSCH has developed an original and highly successful method of silviculture. Stands are thinned every year, sometimes twice a year, beginning at 25 or 30 years of age, until about 10 seed trees per hectare are left. Logs are dragged out by horses, so as to loosen the soil and favor reproduction; because of the density of the latter, it does not matter that some seedlings are destroyed in removing the seed trees. All leaf litter and twigs are left on the ground to protect and enrich the soil. This method has resulted in most

excellent and thrifty reproduction of pine, has favored the increase in proportion of desirable hardwoods, such as beech, and has also resulted in a much more rapid height-growth of the pine than that in the neighboring forests managed by the old clear-cutting system. The method requires much more intensive work and can only be applied by technically trained foresters. By the use of this method von Kalitsch has increased the annual yield of his forest from 2.2 to 6.3 cubic meters per hectare.—*W. N. Sparhawk.*

1260. OPLAND, EVENBY J. Herredsskogmesterinstitutionen og dens betydning for et rationalt skogbruk. [The office of Herred Forester and its relation to a rational forest utilization.] Tidsskr. Skogbr. 28: 210-218. 1920.—The author lays stress on the fact that Norway will always receive much revenue from her forests, that the surest way of safeguarding the forests is by educating the people and by accumulating fundamental knowledge. Until this is assured there must be Government regulation and supervision, for which the office of Herred Forester has been instituted. It is the function of this office to supervise law enforcement, to insure that only properly informed persons prescribe the cuttings, that capable men are put in charge, and that the proper kind of information is gathered. About one-half of the country has now accepted this measure.—*J. A. Larsen.*

1261. OPPERMAN, A. Tilvirkning og anvendelse af Dansk Gavntrae. [Sawing and utilization of Danish woods.] Forst. Forsøgsv. Danmark 5: 301-342. Fig. 1. 1920.—The object of the investigation was to determine how dimensions, shape, and structure affect the amount and quality of the yield. To this end the different parts of the tree were selected in order to determine the sizes and the amounts which may be sawed out for stock to be used for staves, implement handles, shoe bottoms, wagons, etc.; also for lumber of different descriptions. The results of the investigations are given in great detail in tabular form.—*J. A. Larsen.*

1262. ORRE, S. Blinkning i Namdalen. [Marking in Namdalen.] Tidsskr. Skogbr. 28: 246-256. Pl. 5. 1920.—The author describes the results of early marking in the northernmost forests in Norway, and points out the bad results from unscientific marking. The forests are chiefly of spruce (*Picea excelsa*) and birch (*Betula odorata*).—*J. A. Larsen.*

1263. PACK, A. N. Wooden shingles or substitutes. Amer. Forestry 27: 231-237. 13 fig. 1921.

1264. RAMELOW, A. D. Nutzungen des Waldes unter besonderer Berücksichtigung der mit forstlichem Nebenbetriebe verbundenen landwirtschaftlichen Betriebe. [Uses of the forest with special regard to the relation between farm and forest management.] Illus. Landw. Zeitg. 41: 34-35. 1921.—The author gives a brief popular discussion of the utilization of the farm forest or wood-lot. Cut trees may be used for carriage poles, mine-timbers, sleepers, barrels, paper, poles, and facines; certain parts may be used for fire-wood and for local repairs. The forested tract may be used for pasture. Leafy twigs of poplars, aspens, willows, horn-beams, and other broad leaved trees, except alders, may be dried and used as fodder in winter, or the twigs only may be clipped off in winter and saved. Dried leaves, especially those of beech, may be used as bedding for animals. It is desirable to remove some of the beech leaves as they are usually so abundant as to interfere with reproduction.—*John W. Roberts.*

1265. RAVE. Forderungen zum Forstkulturgesetz. [Need for forest law.] Zeitschr. Forst- u. Jagdw. 52: 302-305. 1920.—The need for increasing forest production suggests the enactment of laws governing the management of forest land. All forests which do not show a satisfactory volume and value production should be placed under state supervision. The plan points toward the socialization of forests. The basis for the recommendation is the average yield per acre for 1913 of 187.4 cubic feet on State forests as against 89.3 in private forests.—*Joseph S. Illick.*

1266. RIEMENSCHNEIDER. Die Holhspatenpflanzung bei der Fichte und der Hallimaschpilz. [Planting spruce with hollow spade and the "Hallimasch" fungus.] Deutsch. Forst-



zeitg. 36: 165. 1921.—With this method of planting, losses due to the fungus *Agaricus melleus* are very much more serious than with the method of planting in prepared spots. The latter method also results in thriftier plants and more rapid height-growth, therefore is cheaper in the long run even though the first cost is greater. Douglas fir is most resistant to the fungus, followed by larch, white fir, pine, and spruce.—*W. N. Sparhawk.*

1267. RUBNER. Die Spätfroste und die Verbreitungsgrenzen unserer Waldbäume. [Late spring frosts and limits of distribution of forest trees.] Forstwiss. Centralbl. 43: 41–49, 100–114. 1921.—The distribution of tree species is governed, with few exceptions, by their climatic and edaphic requirements and by their ability to compete with other species, depending on their tolerance, rate of growth, and longevity. No one factor can be designated as the decisive one, but, in the author's opinion, ability of a species to withstand late spring frosts is frequently of more importance than most other factors. The relative frost-hardiness of different trees depends upon the inherent hardness of the species, upon the time when new growth begins, upon the ability to put out new shoots in case the first ones are killed, and also upon the form of the stand in which they occur. Topography is a very important factor because with it varies the probability of frosts, the period of new growth of a given species, and the amount of snowfall and its duration. Late frosts are the decisive factor governing both the horizontal and vertical distribution of a number of native and introduced species of central Europe. The distribution of Scotch pine, fir, spruce, birch, pedunculate and sessile oaks, ash, lindens, hornbeam, maple, and others is discussed.—*W. N. Sparhawk.*

1268. RUEN, IVAR. *Picea pungens*. Dens anvendelighet i vort skogbruk. [*Picea pungens* and its suitability for use in Norwegian forestry.] Tidsskr. Skogbr. 29: 39–47. 1921.—The Colorado blue spruce plantations in Norway show promise that the species will help solve the problem of extending the timberline northward and upward where native trees do not thrive. It may also be used to advantage on the poorer wind-swept sites near the coast. The plantations are now from 13 to 20 years old and are everywhere on precarious sites superior to the other species.—*J. A. Larsen.*

1269. S[CHÜPFER]. Die Nadelholzwälder der Welt und die Aussichten der Holzwarenindustrie. [The coniferous forests of the world and the outlook for wood manufacturing industries.] Forstwiss. Centralbl. 43: 152–154. 1921.—Modern civilization, more than any previous one, depends on timber supplies. Wood, and especially coniferous wood, has become one of the great staple articles of world trade. Conifer forests are largely confined to the northern hemisphere, and the greatest areas are in the Scandinavian region and in North America, the great eastern white-pine forests of the latter being exhausted. The Canadian forests are extensive but very poorly stocked, due to forest fires. The southern pine forests are enormous, but are being cut very rapidly. Within a short period, British Columbia will be the greatest center of the world's lumber industry, and the American Pacific coast will be the only serious competitor of Finland and Sweden. Suggestions that Siberia will become an important factor should not be taken seriously. Austria-Hungary is not a factor and much of European Russia's large forests are economically inaccessible. The conclusion is that the world's supplies of economically exploitable softwoods are much more limited than has been generally believed and that it is necessary not only to exploit what remains but also to grow more.—*W. N. Sparhawk.*

1270. SCHÜPFER. [Rev. of: SCHWAPPACH, ADAM. Mitteilungen aus den forstlichen Versuchswesen Preussens. Untersuchungen über die Zuwachsleistungen von Eichenhochwaldbeständen in Preussen. Zweiter Teil. (1906–1919). (Growth of oak stands in Prussia.) J. Neumann: Neudamm, 1920.] Forstwiss. Centralbl. 43: 192–194. 1921.—Schwappach's oak yield tables of 1905 were based on single measurements of a large number of sample plots of various ages, and therefore give only approximate values. Since then the plots have been remeasured, and curves constructed on the basis of the actual growth on them. The new height curves rise considerably above the old ones, but the basal area and volume curves do not because, with the silvicultural methods best adapted to oak,

—light thinnings in youth, followed by heavier ones,—the basal area increases very little after about the 100th year. The volume curves of 1920 at the 200-year point are considerably below those of 1905, due principally to the fact that a much greater volume is removed in thinnings than was shown by the earlier curves. The total increment, including thinnings, is not very different. The value-increment is probably considerably greater with the heavy thinnings. The question as to the most effective kind and density of understory under the oak is not yet answered.—*W. N. Sparhawk.*

1271. SEEHOLZER. Die Naturverjüngung auf den Juraböden der Oberpfalz. [Natural reproduction on the Jura of upper Palatinate.] Forstwiss. Centralbl. 43: 6–18. 1921.—In this region, natural reproduction is much safer and more certain in producing a valuable stand than artificial reproduction, either by seeding or planting. The climate is rather dry, periods of drought are not uncommon, and the soil dries out and heats very quickly if exposed to the sun. It is necessary, therefore, to use a silvicultural system which will conserve moisture and at the same time prevent undue root competition between seedlings or between seedlings and old trees. The system used must also favor abundant seed reproduction, must maintain the soil in such condition that seeds will germinate and the seedlings establish themselves, and must retain the mixed form of stand,—spruce with from 10 to 50 per cent of beech, fir, and pine, according to local conditions. These requirements are best met by the selection system, occasionally using the strip selection method, and being careful to keep openings rather small. Cuttings should in most cases proceed regularly from the north side of the stand toward the south, in order to conserve moisture. Since the application of the system varies with each variation in local conditions, it requires a very intensive control by a trained forester.—*W. N. Sparhawk.*

1272. SIM, T. R. Timber trees for commercial culture. Further species that have been tried in South Africa. South African Jour. Indust. 4: 161–165. 1921.

1273. SIM, T. R. Tree planting for the farm. I. Selecting the site for the plantation. South African Jour. Indust. 4: 218–223. 1921.

1274. SKÖIEN, OLAF. Antal aar paa sidste Cm. [The number of years' growth on the last centimeter of radius.] Tidsskr. Skogbr. 28: 223–227. 1920.—Mistakes and errors which result from the use of SCHNEIDER's formula are pointed out. Measurements on rapidly growing trees will give a very short period as compared with the slower growing trees and those on poor sites. Irregularities in the periodic growth are thereby overlooked and the arithmetical means of the number of years in the last centimeter on the radius for trees in the same diameter class introduce other errors. The use of the distance for each ten years' growth overcomes these difficulties.—*J. A. Larsen.*

1275. STANG, THOMAS. Vest-Amerikanske traeslag for Norges Skogbruk. [West American trees for use in Norway.] Tidsskr. Skogbr. 28: 257–277. Pl. 1–8., fig. 1–3. 1920.

1276. VANDERYST, HYAC. Contributions à l'étude du palmier à huile au Congo belge: 5°. La récolte des produits de l'Elaeis. [Contributions to the study of the oil palm in Belgian Congo: 5. The collection of the products of Elaeis.] Bull. Agric. Congo Belge 11: 22–36. Fig. 5–8. 1920.—*Elaeis* is one of the most useful trees of the Congo. The natives collect the sap, which by spontaneous fermentation is transformed into a more or less alcoholic drink known as Malafu, or palm wine; the leaves are used for basket work and the fruits furnish oils of great value. The methods employed by the natives in collecting these products are discussed, and the danger incurred by them of contracting sleeping sickness.—*E. M. Doidge.*

1277. VANDERYST, HYAC. Contributions à l'étude du palmier à huile au Congo belge: 6°. Le tronc ou stipe de l'Elaeis. [Contributions to the study of the oil palm in Belgian Congo: 6. The trunk of Elaeis.] Bull. Agric. Congo Belge 11: 37–53. Fig. 9–12. 1920.—In the neighborhood of the mission at Leverville the trunk of *Elaeis* attains an average diameter of 33.6



cm., which is in excess of the average diameter assigned to it by other writers; the maximum observed was 36.7 and the minimum 28.8 cm. A diameter less than 25 cm. has not been observed. Other things being equal, *Elaeis* develops better and more vigorously on a pronounced slope than on a slight slope or on flat ground.—*E. M. Doidge*.

1278. VENDELMANS, H. Making a forest to order. *Sci. Amer.* 124: 232, 240. 4 fig. 1921.—A method of forestry by preculture, as practiced in Europe, is described. The method consists of preparing the land, improving and appropriating it to the intended tree planting, which is then executed at the lowest possible cost. It aims to destroy the natural vegetation, to break up and aerate the soil and insure drainage, to improve the soil and add to its mineral content by applying lime and chemicals, to improve further its physical condition by increasing the power for retaining water, to enrich it with available nitrogen and with a bacterial flora by using green manures, and to make the agricultural crop which follows the green manure pay for the expenses and provide an appropriate medium in which to plant at small cost with the maximum percentage of growth.—*Chas. H. Otis*.

1279. VIKHAMMER, P. Granfro i Troms Fylke. [Spruce (*Picea excelsa*) seed in the Troms district.] *Tidsskr. Skogbr.* 28: 218–220. 1920.—Tests were made of the number of seed per cone, germination per cent, and number of young trees per cone of Norway spruce at the northern limit of its distribution (69° 21' north latitude in Norway). There were from 85 to 164 seeds per cone, a germination of from 5.7 to 34.2 per cent, and from 0 to 10 plants per cone.—*J. A. Larsen*.

1280. WEBER, HEINRICH. Die deutsche Holzbewirtschaftung während des Weltkrieges. [Handling of German wood supply during the World War.] *Allg. Forst- u. Jagdzeitg.* 95: 89–99. 1919.—A complete review of the German wood supply situation during the World War is presented. Germany has been a wood-importing country since 1870. At the outbreak of the war 15 million cubic meters of wood were imported to meet the demands of industries. The German forests in 1913 produced 28.66 million cubic meters of work wood, the consumption of work wood being 43 million. The imported wood came from Russia (52.5 per cent) Austria-Hungary (27.6 per cent), Norway and Sweden (7.3 per cent), U. S. A. (7.1 per cent), and Finland (3.1 per cent). The enemy blockade was so complete and effective that practically all importation ceased. It became necessary to meet all demands from the forests at home and in occupied territory. This compulsory transfer of operations meant a complete reorganization of the wood-supply equipment. In order to meet the situation, there was created a division of raw material in the Department of War. This sufficed for the first 2 years of the war when most of the wood was obtained from the enemy forests in occupied territory. Much wood was obtained from the territory occupied by the army of the East. In the summer of 1916 a marked change took place in the conduct of the war. Excessive demands came from all sides for many different forest products. The situation became so critical that a central organization had to be created. Soon it was divided into 2 sections, and by 1917 there were 7 separate sections each with a distinct line of work. Three periods of development in satisfying the wood-supply of the German army are recognized, (1) from the beginning of the war to the spring of 1916, (2) from the spring of 1916 to December 1916, and (3) from December 1916 to the end of the war. Special modifications of cutting and logging methods were ordered and in spite of the heavy drain upon the forests the latter remain in a fairly good condition.—*Joseph S. Illick*.

1281. WEBSTER, A. D. Brown oak timber. *Gard. Chron.* 69: 164. 1921.—This is a strictly English product confined to the midland and eastern counties. The best timber has been sent to America for thin veneers, 30–40 to the inch, on account of its great value. The dining room of the White House at Washington is entirely panelled with it. The cause of the change in color from white to a rich brown or chestnut is uncertain but is generally ascribed to certain properties in the soil. The use of the wood for panelling has been known from early Tudor times, although only since William the Stadholder came from Holland in 1685 has the most decorative method of wall panelling been adopted. Previous to that time

and up to the Jacobean period panels were small. The best English examples of the early use of this timber are found in the Royal Chapel and Banqueting Hall in the Tower of London, St. Paul's Cathedral (from Welveck in 1695), and the Cloister of Durham Cathedral.—*P. L. Ricker.*

1282. WEBSTER, A. D. Lumbering in British Columbia. *Gard. Chron.* 69: 126. 1921.—A report of a 3-weeks' visit to the lumbering camps is presented, including a brief description of the camps and operating and transportation methods.—*P. L. Ricker.*

1283. WHITFORD, H. N. Tropical forests. *Sci. Amer. Monthly* 3: 267-270. 1921.

1284. WILD, A. D. Wie der Nordsaumplenterschlag sich von selbst einführt und sonstiges aus dem Revier Zabern. [How the north-border-selection cutting originated and other notes from the Zabern district.] *Forstwiss. Centralbl.* 43: 161-172. 1 pl. 1921.—Wild discusses the history of the forests of the Zabern district, which are composed of a considerable variety of stands, including oak, beech, fir, spruce, and pine, pure and in various mixtures. Various silvicultural methods are used, but different forms of selection cutting, with natural reproduction, predominate.—*W. N. Sparhawk.*

1285. WIMMER. [Rev. of: REBMANN. *Der Anbau von Walnussbäumen und amerikanischen Nussbaumarten im Walde.* (Growing walnut trees and American nut trees in the forest.) 68 p., 4 fig. J. Neumann: Neudamm, 1920.] *Forstwiss. Centralbl.* 43: 191-192. 1920.—This is a very thorough and careful treatise on the cultivation of *Juglans regia*, *J. nigra*, *J. cinerea*, *Carya alba*, *C. porcina*, and *C. tomentosa* by a forester who has studied these species for decades.—*W. N. Sparhawk.*

1286. ZELLER. Ansichten über Buchenverjüngungen. [Notes on reproduction of beech.] *Deutsch. Forstzeitg.* 36: 140-142. 1921.—The author's experience indicates that cuttings in beech forests can be made every year, without reference to the occurrence of moist years, and that satisfactory beech reproduction will follow in due time. He believes that young beech seedlings do not need overhead shade,—that they are more thrifty without it.—*W. N. Sparhawk.*

## GENETICS

GEORGE H. SHULL, *Editor*

JAMES P. KELLY, *Assistant Editor*

(See also in this issue Entries 1112, 1125, 1127, 1153, 1176, 1392, 1405, 1410, 1424, 1468, 1553, 1646)

1287. ANONYMOUS. Ratio of sires and dams. U. S. Dept. Agric. Weekly News Letter 8: 8. 1920.—A tabulation of more than 200,000 head of stock kept for breeding purposes on more than 2000 representative farms gave the following average number of females to each male: Cattle 18.9, horses 16.9, swine 11.5, sheep 37, goats 26.6, chickens 23.3, other poultry (geese, ducks, turkeys) 8.5.—*Sewall Wright.*

1288. ANONYMOUS. [Rev. of: CHEVALIER, A. *Sur l'origine des pommiers à cidre cultivés en Normandie et en Bretagne.* (On the origin of cider apples cultivated in Normandy and Brittany.) *Compt. Rend. Acad. Sci. Paris* 171: 521-523. 1920 (see *Bot. Absts.* 8, Entry 377; 9, Entry 1311).] *Gard. Chron.* 68: 223. 1920.

1289. ANONYMOUS. Dwarf maize. [Rev. of: KEMPTON, J. H. A brachytic variation in maize. U. S. Dept. Agric. Bull. 925. 28 p., 19 pl., 8 fig. 1921 (see *Bot. Absts.* 8, Entry 1923).] *Gard. Chron.* 69: 254. 1921.

1290. ÅKERMAN, Å. Untersuchungen über Bastarde zwischen *Epilobium hirsutum* und *Epilobium montanum*. [Investigations on hybrids between *Epilobium hirsutum* and *Epilobium*



montanum.] *Hereditas* 2: 99-112. 8 fig. 1921.—Hybrids between species of *Epilobium* have been reported as occurring among wild plants and are frequently referred to in systematic literature. In such cases it is difficult to determine, from field observations, what the parent species are in particular cases. Artificially controlled hybrids have been produced between *E. hirsutum*  $\times$  *E. montanum* by COMPTON. LEHMANN has produced hybrids by crossing *E. parviflorum* with 3 other species. Reciprocal crosses were different in a number of characters. When *E. parviflorum* was used as female parent the hybrid was quite sterile, no good pollen being produced, while the reciprocal cross produced about 50 per cent good pollen and some mature seed. There were other reciprocal differences. In the  $F_2$  generation obtained from *E. palustre*  $\times$  *E. parviflorum* a large range of independently segregating characters was obtained. The author made reciprocal crosses between *E. hirsutum* and *E. montanum*. Plants of the parent species were grown simultaneously. At the flowering stage the *E. montanum* plants were 60-70 cm. tall while the adjacent  $F_1$  hybrids were dwarfs, about  $\frac{1}{2}$ - $\frac{1}{3}$  as tall and considerably smaller than the smaller parent. The hybrids in other respects were a reproduction of the *E. montanum* plants, with no evidence of the *E. hirsutum* parent. The adjacent parent species grew and flowered normally while the dwarf  $F_1$  plants failed to produce flowers. Now and then  $F_1$  plants more robust than the others appeared, on which the buds reached a higher stage of development than was generally the case. Compton, reporting on this cross, noted the same peculiarities. The reciprocal cross, *E. montanum*  $\times$  *E. hirsutum*, produced  $F_1$  plants of the more vigorous, robust type only. Of the 1919 cultures some of the potted plants were placed in the shade of a tree to prevent too rapid loss of moisture. The stems of these plants grew much more rapidly than the remainder left in the open garden. A more nearly normal development ensued and a few flowers opened, on which the petals were larger than those on the parent. Following this, specimens of hybrids and parents were placed in the north window of the laboratory where the hybrids developed much more rapidly than those left in the garden. The flowers opened completely, the petals resembling those of *E. hirsutum*. In 1920 this experiment was repeated with the same results. The author was unable under these conditions to distinguish reciprocal hybrids. Excessive and scant water supply to shaded plants and to plants in sunlight did not alter the results, indicating that the better development of the shaded hybrids was due to reduced illumination. Backcrosses of these  $F_1$  plants to the parents produced abundant seed, which, however, produced only a few seedlings, many of which were weak and soon died as was true of some in the  $F_2$ , *E. palustre*  $\times$  *E. parviflorum*, reported by Lehmann. Approximately 100 plants of the backcross remained alive and showed a large range of variations and character combinations which does not indicate close linkage of genes. Attempts to find a bacterium as the cause for the dwarfing in  $F_1$  gave negative results. Results show a distinct difference between the *E. montanum*  $\times$  *E. hirsutum* hybrid produced artificially and the wild form of *Epilobium* supposed to be the field hybrid between these 2 species.—J. L. Collins.

1291. ALDERMAN, W. H. Experimental work on self-sterility of the apple. *Proc. Amer. Soc. Hort. Sci.* 14: 94-101. 1917 [1918].—The investigation was begun in 1912. Previous investigation in apple pollination and sterility consisted mainly in studies of bloom clusters enclosed in paper sacks and, for cross-fertilization, emasculation had usually been practiced. Four possible sources of error enter into such tests: (1) Temperature and humidity conditions within paper sacks are abnormal; (2) individual flowers or clusters of flowers were studied without regard to the remainder of the tree; (3) emasculation may produce a decidedly abnormal condition; (4) it has not been shown that pollen from other trees of the same variety may not prove effective even though a single flower or single tree is self-sterile within itself. To eliminate these possible sources of error whole trees were enclosed in cheese-cloth or muslin frames.—The temperature was less variable within the muslin-covered frames than without, being 1-2 degrees higher at night and 2-4 degrees lower on bright days; on cloudy days there was very little difference. The humidity was slightly higher within the frames. In a comparison between muslin-covered frames and paper bags, the latter gave the better results. A summary of 3 years' work with Rome Beauty, York Imperial, and Wagener using pollen from another tree of the same variety shows no advantage over the use of pollen from the same tree.

Normally, not as large a percentage of blooms set fruit in Rome Beauty as in Wagener or York Imperial. Under orchard conditions the set in Rome Beauty is 4.46 per cent, whereas in York Imperial it is 7.87 and in Wagener 8.50.—The relative sterility of 2 varieties may not be judged by a direct comparison of the percentage of fruit set on each, but rather by a comparison of such set of fruit to the normal set of the variety. In the same way the efficiency of a mutual pollenizer may not be judged by a direct comparison of its effects upon 2 varieties, but rather by a comparison to the normal set of each. While none of the varieties given in the table are entirely self-sterile, they are greatly benefited by cross-fertilization. For Rome Beauty the percentage of set was increased  $3\frac{1}{2}$  times, York Imperial 14 times, and Wagener 7 times. The size of individual fruits was increased by crossing; for Rome Beauty the increase over the size of self-pollinated fruits was 27.8 per cent, and for York Imperial 42.7 per cent. In 1914 and 1915 tests the set of fruit from emasculated buds was more than double that from buds not emasculated. Leaving calyx and corolla intact, removing corolla only, or removing both calyx and corolla appeared to make no difference in the results. The probable explanation of increased activity in emasculated blooms may be found in the protection it affords against superabundant pollination by the blooms' own pollen. Probably self-pollination frequently occurs naturally before artificial cross-pollination is brought about. Tubes of foreign pollen must then compete with tubes of the flowers' own pollen, with the result that chances of cross-fertilization are lessened.—A table of seed production shows that there are from 2 to 6 times as many seeds in the crossed fruits as in the selfed ones.—The possible presence of toxic secretions from stigmas was investigated, over 200 tests being made in which pollen of several varieties was germinated in stigmatic extracts from the same variety or other varieties. No toxic action was discovered. Thus it is evident that sterility is not a result of inhibition of pollen germination by toxins.—In a 1915 test of the value of cross-fertilization 6 hives of bees were placed in a section of a Rome Beauty orchard, and blooming branches of other varieties were fastened upright in pails of water suspended in the trees; 16 trees were observed. At some distance 16 similar trees were used as a check. The bee section produced more than twice as much fruit as did the check section, indicating clearly the value of bees in an orchard. The bee plot more thoroughly self-fertilized than the rest of the orchard would probably have shown some gain, but it is believed that the gain was due primarily to the cross-fertilization that must have taken place.—C. S. Crandall.

1292. ALTENBURG, EDGAR. *Interference in Primula sinensis*. Amer. Nat. 55: 78-80. 1921.—Upon recalculating the linkage data presented in a former paper (Genetics 1: 354-366. 1916), the writer finds, by correcting an error of calculation, that they indicate interference of about the same degree as found in *Drosophila*. Only plants with red stigmas were used in this calculation. The total crossing over in the 2 regions was 11.2 and 36.6 per cent; observed double crossovers, 2.9 per cent; coincidence,  $2.9 \div 4.1$ , or 0.7; total number of individuals, 1876.—E. G. Anderson.

1293. AUCHTER, E. C. A preliminary report on apple and pear breeding in Maryland. Proc. Amer. Soc. Hort. Sci. 17: 19-32. 1920 [1921].—Pear crosses were made in 1905 and in each succeeding year, except 1915, to and including 1917. The aggregate of seedlings grown was 1368, representing 10 of the 12 years. Ten varieties appear as parents in 28 crosses representing 17 parental combinations. Kieffer was the female parent in 10 crosses, for which 5 varieties supplied pollen, and served as the male parent in 8 crosses on 4 varieties. The report of results is deferred pending fruiting of the seedlings.—Apple crosses were made in each of the 12 years 1906-1917. Sixteen crosses of 1910-1911 yielded no seedlings. The 827 seedlings grown represent 22 varieties used as parents in 17 combinations in 45 crosses. This report considers 166 seedlings, from the crosses of early apples in 1907, that have fruited; they represent 11 parental combinations. A table gives, for each group, flowers pollinated, fruits picked, seed production, seedlings transplanted, number fruited, number dead, and number not yet fruited. It appears that 2940 pollinations gave 334 fruits,—11.36 per cent of the pollinations successful. The average seed content was 4.57. Germination of seeds of the different groups ranged from 0 per cent for 5 seeds from the cross Early Ripe  $\times$  Williams, to 92.73 per cent for



the cross Williams  $\times$  Early Ripe. The average percentage of germination for all groups was 47.31. Of the 493 seedlings, 459, or 93.1 per cent, were permanently planted and of these 425 are living at the end of the 13th year; they represent 86.2 per cent of the germinations and 92.6 per cent of the seedlings permanently planted.—A 2nd table gives details of fruit descriptions, showing distribution as to form, size, color, flavor, and season. Regarding shape and length, illustrations are drawn from the table showing "that it was not so much a matter of either parent transmitting most of its characters, but that rather certain factors or characters in certain varieties were the dominant ones and were transmitted regardless of which parent the certain variety happened to be." Critical study of color transmission is deferred, "but in general it can be seen that the factor or factors which carry color (red, pink, or carmine) are dominant over the factor or factors carrying yellow." "In this case again the fact that red color seems to be dominant, appears to be more important and significant than the question of whether the male or female parent is the more prepotent in this respect." Of 19 seedlings from 2 yellow parents,—Yellow Transparent  $\times$  Early Ripe,—1 bore a red-striped fruit and 1 a solid red fruit indicating that the parents, one or both, are heterozygous for color.—None of the parent varieties bear sweet fruits, but several seedlings with sweet fruits appear in several crosses. "These are not very numerous, however, and probably the factors carrying sweetness are recessive. In nearly every case there are higher percentages of acid to sub-acid fruits than there are of mild sub-acid or nearly sweet. This holds again regardless of which parent is the male or female and suggests that the factor or factors which carry acid or sub-acid are dominant over those carrying mild sub-acid or nearly sweet flavor."—"The range of the ripening period did not extend over two weeks on either side of the ripening period of the parents and, in general, most of the seedlings of a certain cross ripened during the same period as the parents."—Of the 166 seedlings 24, from 6 crosses, are recorded as very promising, and 11 additional ones, from 3 of these crosses, are reserved for further testing. The very promising seedlings are: Yellow Transparent  $\times$  Williams, 6 of 29; Yellow Transparent  $\times$  Red June, 2 of 14; Yellow Transparent  $\times$  Early Ripe, 1 of 19; Williams  $\times$  Early Ripe, 4 of 35; Williams  $\times$  Yellow Transparent, 10 of 51; and Early Ripe  $\times$  Yellow Transparent, 1 of 13.—In 1907 seedlings from open-pollinated fruits were grown as follows: From Yellow Transparent 148, Williams 89, and Early Ripe 9. Ninety of these had fruited and 1 each from Yellow Transparent and Williams were recorded as promising. [See also Bot. Absts. 9, Entry 785].—C. S. Crandall.

1294. BABCOCK, E. B. Bud selection and the frequency of mutations. Proc. Amer. Soc. Hort. Sci. 17: 40-44. 1920 [1921]. Bud variations in horticultural plants are discussed and it is pointed out that very little is known concerning the frequency of their occurrence. Both species and varieties, however, are known to differ in regard to the frequency with which bud mutations occur, and therefore it may be expected that more variations will occur in certain fruit trees like the citrus than in the deciduous fruits. Examples are given of plants which produce frequent mutations and of those which produce few or no mutations; the bearing of the *Drosophila* investigations on the subject of bud mutations is briefly discussed. In closing the writer discusses the tendency of nurserymen to advertise stock grown from known high producers without experimental proof as to their superiority, and advocates the carrying on of more experimental work in this field.—Richard Wellington.

1295. BABCOCK, E. B., AND J. L. COLLINS. Interspecific hybrids in *Crepis*. I. *Crepis capillaris* (L.) Wallr.  $\times$  *C. tectorum* L. Proc. Nation. Acad. Sci. 6: 670-673. 1920.—*Crepis tectorum* has 4 pairs of chromosomes, while *C. capillaris* has 3 pairs; the  $F_1$  hybrids have 7 chromosomes. Forty of these hybrids were raised as seedlings. None produced true leaves, but they remained for months in the cotyledonary stage before perishing; the tissues were found to be in a chaotic condition.—John Belling.

1296. BALTZER. [German rev. of: HERTWIG, PAULA. Abweichende Form der Parthenogenese bei einer Mutation von *Rhabditis pellio*. Eine experimentelle cytologische Untersuchung. (Aberrant form of parthenogenesis in a mutation of *Rhabditis pellio*. An experimental cytological study.) Arch. Mikrosk. Anat. 94: 303-337. 1920.] Zeitschr. Indukt. Abstamm.- u. Vererb 25: 254-255. 1921.

1297. BALTZER. [German rev. of: HERTWIG, PAULA. Haploide und diploide Parthenogenese. (Haploid and diploid parthenogenesis.) Biol. Centralbl. 40: 145-174. 1920 (see Bot. Absts. 6, Entry 1695).] Zeitschr. Indukt. Abstamm.- u. Vererb. 26: 180-181. 1921.

1298. BALTZER. [German rev. of: LEVY, FRITZ. Die Kernverhältnisse bei parthenogenetischen Fröschen. Ein Beitrag zur Physiologie und Pathologie der Zelle. (The nuclear relations in parthenogenetic frogs. A contribution to the physiology and pathology of the cell.) Sitzungsber. Preuss. Akad. Wiss. Berlin 1920: 417-425. 1920.] Zeitschr. Indukt. Abstamm.- u. Vererb. 26: 181-182. 1921.

1299. BARKER, E. E. Relacion existente entre el cruzamiento de plantas y la agricultura. [The relation existing between crossing of plants and agriculture.] Rev. Agric. Puerto Rico 5: 4-12. 1920.—A brief sketch is presented of the development of genetics and its practical application to plant breeding problems with suggestions for specific application to Porto Rican problems.—E. E. Barker.

1300. BATESON, W. Genetic segregation. Amer. Nat. 55: 5-19. 1921.—There is a large group of cases in plants in which the reduction division cannot be coincident with segregation.—(1) In *Matthiola*, all the pollen-grains of the double-throwing singles carry the factor for double, while some of the egg-cells have the factor for single, others the factor for double. The same is the case, *mutatis mutandis*, with the factors for white and cream petals. The pollen-grains are uniformly sound.—(2) A comparable difference between pollen and egg-cells has been demonstrated in *Oenotheras*, though here there are many empty pollen-grains.—(3) In *Campanula carpatica*, all the pollen-grains of a certain hermaphrodite plant, heterozygous for blue flower, carry the factor for femaleness; and more of them carry also the factor for white flower. The pollen-grains are sound.—(4) In heterozygous single *Petunias*, all the pollen-grains carry the dominant factor for singleness; the pollen-grains are sound.—(5) *Begonia Davisii* is a wild form with single flowers. All the pollen-grains carry the factor for double flowers. The pollen gives all doubles when used on double varieties; single is dominant. These pollen-grains are sound.—(6) A recessive strain of *Linum usitatissimum*, from a cross, had anthers with only occasionally a few good pollen-grains. Pollinated from 3 other varieties of flax, only recessives were produced. Thus these 3 flaxes were heterozygous for the factor in question, and all their pollen bore the recessive factor.—(7) A difference in the linkage value for the microspores and megaspores of *Primula sinensis* is due to somatic segregation.—(8) The production of certain periclinal chimeras is due to somatic segregation.—(9) In crosses of rogue peas with the normal forms, the factors peculiar to the normal form are left behind in the lower parts of the  $F_1$  plants, the upper parts being pure rogue.—(10) In *Funaria hygrometrica*, from the perigonal leaves around the antheridia, plants bearing only antheridia were regenerated; while regenerations from leaves surrounding the archegonia produced monoecious plants only. Thus somatic segregation can occur even in a haploid form.—(11) A variegated *Adiantum capillus-Veneris* produced only green prothallia. The young ferns raised from these prothallia were green, white, or variegated. Hence somatic segregation must have occurred in the haploid tissue of the prothallia.—John Belling.

1301. BAUR, E. [German rev. of: HAGEM, OSCAR. Arvelighets-Forskning. En oversigt over nyere resultater. (Genetical investigation. A review of new results.) 317 p. Aschehoug & Cie.: Kristiania, 1919.] Zeitschr. Indukt. Abstamm.- u. Vererb. 26: 254. 1921.

1302. BAUR, E. [German rev. of: KRONACHER, C. Allgemeine Tierzucht. Zweite Abteilung. Fortpflanzung-Variation und Selektion-Vererbung. Zweite, vermehrte und durchgearbeitete Auflage. (General animal breeding. 2nd part. Reproduction-variation and selection-heredity. Second enlarged and completely revised edition.) Parey: Berlin, 1920.] Zeitschr. Indukt. Abstamm.- u. Vererb. 26: 176. 1921.

1303. BAUR, E. [German rev. of: REINKE, J. Kritik der Abstammungslehre. (Critique of the evolution theory.) 133 p. Johann Ambrosius Barth: Leipzig, 1920.] Zeitschr. Indukt. Abstamm.- u. Vererb. 26: 178-179. 1921.



1304. BEACH, S. A. **Fruit breeding in the northwest and its significance in horticultural development.** Proc. Amer. Soc. Hort. Sci. 17: 13-19. 1920 [1921]. A general discussion is presented.—*J. P. Shelton.*

1305. BEMMELEN, J. F. VAN. **Das Farbenmuster der mimetischen Schmetterlinge.** [The color pattern of mimetic butterflies.] Zool. Anzeiger 52: 269-277. 1921.—The author says that one should be unprejudiced by the "mimicry hypothesis." Each group of animals must be considered by itself from the point of view of comparative morphology. The same evolutionary tendencies underlie evanescence or modification of color pattern in different families and this produces forms with superficial resemblances. The more usual character in a group is not necessarily the more ancestral; the 2 genera of monotremes are not derived from other mammals. Narrow "mimetic" wing and body occurs in several different families of butterflies, showing that hereditary fundaments for this character are present in all. "Mimicry" once appearing may be of survival value, but natural selection is not a creative force. The loss of tails in females of *Papilio* is atavistic, for ancestral Lepidoptera have no tails. Females are more primitive although English writers regard "mimetic" females of *P. dardanus* as departures from the ancestral type produced by natural selection to resemble Danaids of the particular region in which they occur. Sex differences are not fundamentally different from other types of variation within species.—*P. W. Whiting.*

1306. BREITENBECHER, J. K. **The genetic evidence of a multiple (triple) allelomorph system in *Bruchus* and its relation to sex-limited inheritance.** Genetics 6: 65-90. 1921.—The author finds 4 types of the "four-spotted cowpea-weevil," *Bruchus maculatus*, Fabr., distinguished in the females by the body-colors, on the elytra and elsewhere, of red, black, white, and tan. In males, the color distinctions are not sufficiently marked to make the separation by the eye practicable in genetic experiments. Tan, which in females is the usual color of the wild beetles, is, in general, the color of all males. Sex-linked inheritance is not shown; on the other hand, sex-limited inheritance is as just explained. The "mutants," as the author terms all but the tan type of female, have frequently been found in cultures from various parts of the U. S. A. Each type is described. Each color is determined by a gene allelomorphic to each of the other color-genes, making a multiple allelomorphic group of 4. This is demonstrated by 69 different matings, producing over 100,000 individuals. The order of dominance is red (dominant to all), black, white, tan; order of greatest fertility and vigor, black, red, tan, white; order of greatest size, black, tan, red, white. "There is a marked variation as regards color. . . . For the whites may approach the blacks and the reds may verge on the whites as well as on the tans."—*John S. Dexter.*

1307. BUCHANAN, J. ARTHUR. **The Mendelianism of migraine.** Med. Rec. 98: 807-808. 1920.—Heredity is defined in the Mendelian sense as applied to a disease and it is shown that migraine conforms to the definition. The material for the study was obtained at the Mayo Clinic and included 127 families with a total of 808 children. When both parents are migrainous all the children have migraine. When neither parent is migrainous but is of migrainous stock or if 1 parent only is migrainous, migraine appears among the children approximately in the ratio of 1:3. "There is no medication known that will alter" the course of the disease; "it is a distinct part of the patient's economy."—*Howard J. Banker.*

1308. BURCH, D. S. **Pure-bred sires lead rapidly to improvement in female stock.** Jour. Heredity 12: 45-48. Fig. 32-34. 1921.—The author describes results of the "Better sires—better stock" campaign of the Department of Agriculture [U. S. A.]. There has been a distinct increase in the ownership of pure-bred females among those enrolled in the campaign.—*Sewall Wright.*

1309. BURGEFF, H. **Sexualität und Parasitismus bei Mucorineen.** [Sexuality and parasitism in the Mucorineae.] Ber. Deutsch. Bot. Ges. 38: 313-328. 1921.—The author reviews his previous work on the Mucor parasite *Chaetocladium*, in which he showed the gall cell to be a mixture of protoplasm and nuclei of parasite and host, and in which he suggested that the

parasitism of *Chaetocladium* was related to the sexual process and had arisen as an attempt at hybridization. New data in support of this view are furnished by the *Mucor* parasite *Parasitella simplex*, of which the author has isolated the (+) and (-) races and obtained the zygospores. The formation of the gall cell is essentially similar to the process in *Chaetocladium*, except that in *Parasitella* the gall cell formed by a mixture of protoplasm of parasite and host becomes a storage organ in the form of a thick-walled body resembling an azygospore. Both (+) and (-) races of *Parasitella* parasitize both (+) and (-) races of most *Mucor* species, such as *Rhizopus nigricans*, *Mucor Mucedo*, and *M. heimalis*. *Parasitella* (+), however, parasitizes only the (-) race of *Absidia glauca*, and *Parasitella* (-) only the (+) race of this *Absidia*. A (-) race of *Chaetocladium* parasitizes only the (+) race of the same *Absidia* while parasitizing both (+) and (-) races of *Rhizopus* and *Mucor*. It is concluded that the hypothetical sexual substance which distinguishes the (+) and (-) mycelia of *Absidia* is in this case identical with the substance which induces parasitism; and that the parasitism of *Chaetocladium* and *Parasitella* is sex-limited in respect to *Absidia glauca*, but is not sex-limited in respect to *Rhizopus* and other genera. From the foregoing and from the fact that the (+) and (-) races of *Rhizopus* show imperfect hybridization reactions with the opposite sexes of *Absidia* it is further concluded that *Rhizopus* and *Absidia* possess like sexual complements but that *Rhizopus* has a special complement in addition which completes the sexual and parasitic complements of *Parasitella* (+) and *Parasitella* (-) and brings them into activity.—*A. F. Blakeslee*.

1310. CASTLE, W. E. A new type of inheritance. [Rev. of: SCHMIDT, JOHS. Racial investigations. IV. The genetic behavior of a secondary sexual character. Compt. Rend. Trav. Carlsberg Lab. 14<sup>3</sup>: 1-21. Color pl. 1-5. 1920.] Science 53: 339-342. 1921.

1311. CHEVALIER, A. Sur l'origine des pommiers à cidre cultivés en Normandie et en Bretagne. [On the origin of cider apples cultivated in Normandy and Brittany.] Compt. Rend. Acad. Sci. Paris 171: 521-523. 1920.—For northwest France there have been described 500 to 1000 varieties of cider apples. The origin of these apples is not well known. It was formerly held that there was but a single Linnaean species, *Malus communis*, which included all cultivated crabs and apples, but excluded the *Malus* of eastern Asia and North America, which are very different species.—It appears necessary to divide *Malus communis* into 4 elementary species, capable of hybridizing among themselves and producing many fertile races which are sources of cultivated varieties. These species are *Malus acerba* Merat, *M. dasyphylla* Borkh., *M. praecox* Borkh. (these 2 are often united as *M. pumila* Mill.), and *M. prunifolia*.—The species *M. acerba* Merat (1815) includes apples growing spontaneously in the forests of nearly all of Europe. It had previously been designated under the name *M. spinosa* Rousset, Fl. Calvados (1806) and as *M. sylvestris*, Miller Gard. Dict. (1759). It is this last and oldest name that should be preserved.—All French authors have erroneously assigned the origin of cider apples to *M. acerba* and of table apples to *M. dasyphylla*. Examination of many varieties of cider apples, cultivated in the west, proves that none of them agreed with *M. acerba*, but they should be referred, like the varieties of our gardens, to *M. dasyphylla*, a species introduced from Spain. The explorer G. CAPUS discovered *M. dasyphylla*, occurring spontaneously in forests in Armenia and Turkestan, in 1881. Its culture extended from remote antiquity throughout the borders of the Mediterranean Basin and to-day it is found spontaneous in forests of Sicily and of Spain. The author observed it under similar conditions in the department of Alpes-Maritimes approaching an altitude of 3000 feet.—This species, represented in its native home by many races (*M. mitis*, *M. astracanica*, *M. Neidzwetzkyana*, etc.) has been the point of departure of edible varieties cultivated in Egypt under the 19th dynasty (JORET).—*M. praecox* is only another paradise or Saint-Jean apple used as a stock for dwarfing garden varieties. It came originally from the southeast in Russia and Asia Minor and appears to have been carried to Europe at the time of the Crusades. *M. prunifolia* originated in central Asia and its culture has spread on the one hand towards Russia and Siberia and on the other towards China and Japan.—The 4 species cited and their diverse races, still not well known, transformed by culture and by hybridizing among themselves in various degrees, have supplied the very numerous kinds of cultivated apples. [See also Bot. Absts. 8, Entry 377; 9, Entry 1288.]—*C. S. Crandall*.



1312. CHILD, C. M. Studies on the dynamics of morphogenesis and inheritance in experimental reproduction. XI. Physiological factors in the development of the Planarian head. Jour. Exp. Zool. 33: 409-433. 33 fig. 1921.—Form of head, sense organs, and ganglia in regenerating Planaria depend on position of cut, physiological gradients, and other things, as well as heredity. What is inherited is a group of potentialities, certain ones of which are realized. Environment affects development through differential inhibitions. Normal development is uniform because conditions are uniform. Alterations initiated quantitatively produce qualitatively different results in morphology and physiology.—A. Franklin Shull.

1313. CLASSEN, K. Vererbung von Krankheiten und Krankheitsanlagen durch mehrere Generationen. [Heredity of diseases and of disease tendencies during several generations.] Arch. Rassen.- u. Gesellschaftsbiol. 13: 31-36. 1918.—A case of hereditary nervous weakness is reported which expresses itself through various grades of weaknesses and scoliosis of the vertebral column up to hereditary cerebellar ataxy. Anatomical symptoms consist in marked weakness and tremor of the limbs and facial muscles, and atrophy of the cerebellum. It does not begin before 50 years of age. The author gives considerable pedigree of the family showing the occurrence of various degrees of the disturbance. He suggests that modern experimental methods will explain the pedigree but does not venture a more detailed statement.—C. C. Little.

1314. CORRENS, C. Individuen und Individualstoffe. [Individuals and individual substances.] Ber. Senckenberg. Naturf. Ges. Frankfurt a. M. 47: 65-66. 1919.—Inhibitive substances responsible for self-sterility, failure of tissue transplantation, and substances responsible for individual odors are not necessarily due to the existence of individual substances. The conception of individual substances, in the sense of chemical materials peculiar to an individual and not connected with heredity, is inconsistent with modern studies of genetics. Individuality is the expression of a particular combination of heritable units acting in a particular environment.—R. E. Clausen.

1315. CRANDALL, C. S. An experience in self-fertilization of the peach. Proc. Amer. Soc. Hort. Sci. 17: 33-37. 1920 [1921].—Peach blossoms under control were subjected to 2 treatments: (1) Blossoms without apparent imperfections were pollinated, after emasculation, with pollen from the same tree; (2) blossoms were covered, without previous emasculation or hand-pollination. The trees used were seedlings from various crosses. Of 1207 hand-pollinated blossoms 36.2 per cent set fruits, of which 4.5 per cent had undeveloped embryos, and from which 43.25 per cent furnished trees for the orchard (1 tree to 6.38 flowers). Of 1230 covered buds not hand-pollinated 15.68 per cent set fruit, of which 31.41 per cent furnished trees for the orchard (1 tree to 20.5 buds). Individual variations are given, ranging from 11.68 to 61.42 per cent of blossoms setting fruits from hand-pollinations. Germinations ranged from 0 to 95.45 per cent. In the greenhouse 30 per cent of hand-pollinated blossoms yielded fruit, of which about 32 per cent had undeveloped embryos. From 1955 blossoms pollinated in 1915-1919 inclusive, 647 fruits were obtained (33.7 per cent), of which 441 (68.2 per cent) had developed embryos and from which 28 trees were obtained, furnishing 1 tree to 70 flowers. [See also Bot. Absts. 9, Entry 807].—C. H. Connors.

1316. CROW, J. W. Breeding method with horticultural plants. Proc. Amer. Soc. Hort. Sci. 16: 19-24. 1919 [1920].—The author classifies plants for breeding according to method of propagation into the 3 major divisions with various subdivisions; examples are given of each. The principles of evolution as well as of plant breeding concerned in the work are noted; likewise the importance of mutations and subsequent pedigree tests. Lettuce has been found to be completely self-fertilized and celery nearly so. The author's work with onions shows that more progress can be made by selfing. Choice stalks are grown under glass and these are later hand-pollinated. It is noted that much of the disappointment experienced by breeders in the past has been due to the use of material carrying undesirable characters. Selfing is suggested as a means of purifying strains, subsequently crossing the purified strains to get desired combinations.—Many of the most important breeding problems depend on com-

binning vigor, or constitution, with other desirable characters, such as texture, size, color, and aroma. "It seems to be the fact that, in general, plants inherit type and constitution more largely from the mother than from the pollen parent." This conclusion is based on extensive work with strawberries. In practice the aim "is to get the individual which combines in fullest measure the constitution of one parent and the finer qualities of the other." In general these 2 qualities are not usually found united in the same individual. The author has evidence which suggests the desirability of using the higher quality plant as the ovule parent and the robust one as pollen parent since it is probable that "by this method it is possible to eliminate a very much larger percentage of seedlings in the first two or three years." On the other hand, if a robust plant is used as mother, a larger percentage of seedlings of robust constitution is obtained, which require years of time in testing. This method is suggested in hybridizing roses and fruits where hardiness is a desirable factor.—Regarding the inheritance of disease resistance, the generally accepted belief is noted that the difference in virulence of different strains of organisms may be equal to or greater than the difference in resistance of the cultivated plants; but the possibility is suggested of incorporating disease resistance of some varieties, in which it is general, into other varieties in which it is absent. The author also suggests the substitution of the word "isolation" for the commonly used term "selection," because the former term more nearly describes what is really practiced in improvement work. [See also Bot. Absts. 6, Entry 115.]-C. E. Myers.

1317. CURTIS, ROBERT S. The fundamentals of livestock judging and selection. 14 × 20.5 cm., 464 p., 190 fig. Lea & Febiger: Philadelphia, 1920.—A text-book of livestock judging; first edition appeared in 1915.—Sewall Wright.

1318. CUTTING, E. M. Heterothallism and similar phenomena. New Phytol. 20: 10-16. 1921.—The author reviews a number of papers pertinent to the subject of heterothallism, notably those of BLAKESLEE, BURGEFF, ATKINSON, GRUBER, and BURGER, on various Mucorine fungi. Similar phenomena observed by CLINTON and by MURPHY in *Phytophthora* spp., by FITZPATRICK in *Eocronartium*, by KNIPE and BENSUADE in various Basidiomycetes; by EDGERTON in *Glomerella*; and by TAUBENHAUS in *Sclerotium Rolfsii* are mentioned and discussed.—Charles Drechsler.

1319. CZUBER, E. Über Funktionen von Variablen, zwischen welchen Korrelationen bestehen. [Functions of variables between which correlations exist.] Metron 1: 53-61. 1920.—The author extends PEARSON'S formulae for the mean and standard deviation of an index to the general case, expressing the mean and standard deviation of any function in terms of the means, standard deviations and coefficients of correlation of its arguments.

If  $V = f(X_1, X_2, \dots, X_n)$

$$M = \frac{1}{N} \sum (V) = f + \frac{1}{2} [f_{11}\sigma_1^2 + f_{22}\sigma_2^2 + \dots + f_{nn}\sigma_n^2] \\ + f_{12}\sigma_1\sigma_2r_{12} + f_{13}\sigma_1\sigma_3r_{13} + \dots + f_{23}\sigma_2\sigma_3r_{23} + \dots$$

where  $f = f(M_1, M_2, \dots, M_n)$ ,  $M_1$  being the mean of  $X_1$ , etc.

$$f_1 = \frac{\partial f}{\partial M_1}, \quad f_2 = \frac{\partial f}{\partial M_2}, \dots$$

$$f_{11} = \frac{\partial^2 f}{\partial M_1^2}, \quad f_{12} = \frac{\partial^2 f}{\partial M_1 \partial M_2}$$

$$\sigma_v^2 = f_1^2\sigma_1^2 + f_2^2\sigma_2^2 + \dots + f_n^2\sigma_n^2 + 2f_1f_2\sigma_1\sigma_2r_{12} + 2f_1f_3\sigma_1\sigma_3r_{13} + \dots$$

$$+ 2f_2f_3\sigma_2\sigma_3r_{23}. \text{—John Rice Miner.}$$

1320. DEHORNE, LUCIENNE. Hermaphroditisme et scissiparité. [Hermaphroditism and schizogenesis.] Compt. Rend. Acad. Sci. Paris 169: 1110-1112. 1919.—It has long been known



that all buds in 1 chain of Polychaete *Myrianida* are of the same sex, and that male-producing and female-producing stocks are alike in structure and behavior. These stocks, however, are different in certain biological features. Thus, male-producing stock buds more freely, since 10-30 individuals are found in one male chain, rarely more than 5 in one female chain. Also, male-producing stock is slender, its tissues transparent, its nephridia indistinct like those of a young worm, while female-producing stock is stouter, and its tissues dense and opaque like those of the old animal. At the beginning of sexual reproduction (March) male chains are rare and female chains rather common, and there are many fragile specimens not yet budding. Non-budding individuals decrease and male chains increase in number as the season advances, until male chains are the more abundant. As autumn approaches, however, female chains are in the majority. Male chains collected in this latter period have fewer individuals and male-producing stocks are stouter than earlier in the season. As a male-producing *Myrianida* ages it approaches the condition of female-producing stock, acquiring a degree of intersexuality; that is, in a sense, it is a protandrous hermaphrodite. Changes are related to activity of metabolism, a high rate being associated with male-production, a lower rate with female-production.—*A. Franklin Shull.*

1321. DEMBOWSKI, JAN. Das Kontinuitätsprinzip und seine Bedeutung in der Biologie. [The principle of continuity and its significance in biology.] Vortr. u. Aufsätze Entwicklungsmech. Org. 21: 1-132. 1919.—In evolution, characters do not arise singly and successively; the whole organism is altered simultaneously. Neither evolution nor ontogeny can occur under constant conditions. Definitions of heredity involving parent and offspring are misleading, since heredity is a process and is continuous. Germ-plasm is the basis of continuity, but WEISMANN's theory employing a system of discrete objects violates the principle of continuity. The whole organism is composed of germ-plasm. Germ cells hold no independent place in the organism; there is no fundamental distinction between soma and germ-plasm, and no distinction between inherent and acquired characters. The capacities of living substance have no beginning, they simply exist. The development of any animal rests upon one phenomenon, namely, continuity of living substance with all its capacities and properties. The gene is not a unit of heredity, but a unit of development; the organism does not consist of such units, Mendelians merely recognize them. Progress in heredity will be made only when causes of phenomena are discovered, and such discoveries will come, not from hybridization experiments, but from study of general physico-chemical processes in ontogenetic development. Form in embryogeny is the result of the physico-chemical constitution; it is never a cause, being itself the effect of properties of living substance. Individuality of chromosomes is not proved by constancy of number, nor by constant size differences, nor by constant differences of form; and other evidences of individuality are of doubtful or negative value. Reduction division is asserted to result in all possible combinations of chromosomes, hence chromosomes must be equal, otherwise abnormalities would occur. The structures in the nucleus have no greater influence on development than do yolk and oil droplets. Facts supposed to show the importance of chromosomes may be otherwise explained. Chromosome theories of heredity have no significance. To find the material of heredity the chemistry of protoplasm must be studied. A developing embryo is a single continuous thing, its division into cells is of no significance. A formless, little-differentiated living substance, or plasma, is responsible for the course of development. The fate of blastomeres depends on their chemical and physical composition and that of their surroundings. Gastrulation is a physical phenomenon. The course of regeneration depends upon undifferentiated plasma, and the problem of regeneration is much like the problem of ontogeny, for germ-cells are not predestined elements but owe their capacities to their origin from plasma not involved in ontogeny. Regeneration is not a function of cells at the wound, but of the entire continuous organism, for cells at the wound would not, apart from the remainder of the whole, regenerate what they do. The principle of continuity harmonizes the contradictions of vitalism. It shows, for example, that an echinoderm egg is neither a machine nor a harmonious equipotential system. The statement of the vitalist that biology is an independent fundamental science violates the principle of continuity because it confuses phenomena with the method of investigation.—*A. Franklin Shull.*

1322. DUNLOP, W. R. Variation in the banana. Agric. News [Barbados] 20: 87. 1921.—The author notes a few earlier instances of variation in the banana. In 1895 a plant in Trinidad produced fruit low down on the side of the sucker (pseudostem). A Chinese banana, also in Trinidad, produced a double bunch of fruit, while there is an instance of a plantain from Bombay with 4 tassels of flowers. It is supposed that the 1st named peculiarity has a mechanical explanation while the 2 last-named phenomena are probably instances of the rare dichotomous branching of the Musas. From Barbados there is reported a bunch of bananas with twisted stem (fruit stalk), probably due to pathological disturbances. However, the most remarkable and interesting peculiarity observed is segregation of colors. The fruit of a variegated sucker observed by the author in Guatemala had the following composition and characteristics: Pure claret-colored (red) fingers, 20; pure green or yellow, 36; half-claret and half-green, 5; and red with green tip, 10. The claret fingers with green tips possessed the pronounced anterior rib with marked constriction at the tip common to the claret, but resembled the Gros Michel in size and, to a great extent, in color. The half-claret and half-green fingers resembled the Gros Michel in morphological characters. It is to be noted that the coloring of these fingers was definitely bilaterally asymmetrical.—*J. S. Dash.*

1323. DUNN, GRACE A. A comparative study of the two races of *Rhizopus nigricans*. Physiol. Res. 2: 301-339. 1 fig. 1921.—The author has studied chiefly the nutritive requirements of an individual (+) race and of an individual (-) race of *Rhizopus nigricans*, comparing them in respect to their physiological reactions under the terms "male" and "female." Using dry weight of harvest as the criterion, the best nutrient tested was a solution containing the following ingredients in the molecular concentrations indicated:  $\text{KH}_2\text{PO}_4$ , 0.28;  $\text{NH}_4\text{NO}_3$ , 0.0462;  $\text{MgSO}_4$ , 0.0497;  $\text{F}_2\text{PO}_4$ , trace; dextrose, 1.0. The 2 races tested gave about equal dry weight harvests in all the solutions employed where dextrose was the source of carbon.—The 2 races are shown to differ physiologically in 3 respects although "of course the male and female races of other strains of *Rhizopus nigricans* might not show these differences." (1) They behave complementarily in conjugating; (2) the "male" race produces a greater abundance of sporangia in good solutions than does the "female"; (3) the "male" race produces a greater dry weight harvest in solutions where glycerine is the source of carbon. This three-fold generalization is offered as a step toward an analysis of the physiological differences connected with the sexual difference between the 2 races.—*A. F. Blakeslee.*

1324. ERIKSON, GÖSTA. Gedanken zur Rotkleezüchtung. [Thoughts on red clover breeding.] Zeitschr. Pflanzenzücht. 8: 79-85. 1921.—The average red clover crop of Sweden, Norway, and Denmark is but 25-30 per cent of the maximum. This reduction is due in part to improper preparation of hard seed and to improper mixtures of clover with grasses used. The best farmers grow their own seed and sow it without preparation, often in an unhulled condition.—The writer observed that some place strains, in comparative trials, did comparatively much better in certain years, due mainly to differences of reaction toward soil moisture.—Certain colors, such as gray, characteristic of some strains, are apparently responsible for the easy invasion of certain parasitic organisms. Clover strains with certain colors of seeds, leaves, and stems are recommended.—Locally adapted place strains of red clover develop which often can not be grown successfully even in nearby localities. Red clover seed should not be exchanged or transferred geographically without critical knowledge of controlling factors and reactions to them.—*L. R. Waldron.*

1325. FIRBAS, HEINRICH. Über künstliche Keimung des Roggen- und Weizenpollens und seine Haltbarkeit. [Artificial germination of rye and wheat pollen and their longevity.] Zeitschr. Pflanzenzücht. 8: 70-73. 1921.—The author reviews previous findings in regard to the longevity of wheat and rye pollen, and discusses briefly the conditions affecting germination in artificial media and on stigmatic surfaces. It is concluded that temperature, air humidity, and age affect the viability of pollen.—*F. P. Bussell.*

1326. FISCHER, ALFRED. Ursachen tierischer Farbleidung. [Causes of animal coat color.] Arch. Entwicklungsmech. Org. 46: 202-209. 1920.—A criticism is presented of a



paper of the same title by H. PRZIBRAM (Arch. Entwicklungsmech. Org. 45: 199-259. 1919). The latter, according to Fischel, attempts to interpret animal coat colors in too simple a way as the product of certain chemical and physical factors, due regard not being given to the morphological evidence on the part played by specialized pigment cells.—*Sewall Wright*.

1327. FRANZ, V. [German rev. of: (1) GOTTSCHICK, F. Die Umbildung der Süßwasser-schnecken des Tertiärbeckens von Steinheim a. A. unter dem Einfluss heisser Quellen. (The modification of fresh water snails of the Tertiary basin of Steinheim under the influence of hot springs.) Jenaische Zeitschr. Naturwiss. 56: 155-216. 3 pl. 1920. (2) PLATE, L. Bemerkungen über die deszendenztheoretische Bewertung der Umwandlungen von Planorbis multiformis. (Comments on the evolutionary significance of the polymorphism of Planorbis multiformis.) Jenaische Zeitschr. Naturwiss. 56: 217-224. 1920.] Zeitschr. Indukt. Abstamm.- u. Vererb. 26: 182-184. 1921.

1328. FRATEUR, J. L. La robe sauvage du lapin. [The wild coat of the rabbit.] Réunion Soc. Belge Biol. 1919: 941-943. 1919.—The author finds that crosses between rabbits with the agouti pattern of the wild species, and the black-and-tan variety give agoutis in  $F_1$  and a 3:1 ratio in  $F_2$ . The black-and-tan variety is dominant over non-agouti and gives a 3:1 ratio in  $F_2$ . He concludes that the so-called agouti factor is complex. In either agoutis or black-and-tans, the white belly may or may not have a dark undercolor. Dark undercolor is dominant over pure white.—*Sewall Wright*.

1329. FRUWIRTH, C. Zu obigem Originalartikel. [Relative to the foregoing article.] Zeitschr. Pflanzenzücht. 8: 77-79. 1921.—[Comment on RAUM. Weissblühender Rotklee eine "umschlagende Sippe?" (White-flowering red clover an "ever-sporting variety?") (See Bot. Absts. 9, Entry 1368).] The author presents data given him in a letter by RIMPAU, and also data of his own, relative to inheritance of white in flower color in families of red clover. The data are inconclusive because a pure-breeding white-flowered strain of red clover was not certainly secured after several generations, although for a number of generations fertilization was done by bumblebees enclosed with isolated plants.—*L. R. Waldron*.

1330. GABRIEL, CYPRIEN. Sur un cas curieux d'adaptation florale. [A curious case of floral adaptation.] Compt. Rend. Soc. Biol. 83: 1441-1442. 1920.—Attention is directed to a previously overlooked dimorphism of the flowers of *Anchusa officinalis*. Type A has clear blue corolla 1.3 mm. long by 1 mm. in diameter, relatively infertile anthers, and is visited by bees and flies. Type B has violet corolla, is 2 mm. deep by 1 mm. in diameter, has long well-developed stamens, and is visited by *Scolia hortorum*. Both types produce nectar but the *Scolia* can not reach it in type A. The latter type sets abundant seed while type B is probably entirely infertile, serving merely as the source of pollen for A.—*Leonas L. Burlingame*.

1331. GALLAUD, M. Une lignée de Giroflées à anomalies multiples et héréditaires. [A line of wall flowers with multiple hereditary anomalies.] Compt. Rend. Acad. Sci. Paris 171: 47-49. 1920.—The author points out that unique examples of monstrosities in these plants have frequently been noted, but that there has been little precise knowledge of the relation of these forms to their parents or progeny.—He has studied 3 successive generations and furthermore has obtained as part of a single plant a large number of anomalies, some of which are already known and others are believed to be new. These are listed as follows: 1. *Pluricotyl embryos*. All seeds have shown this variation in percentages of from 7 to 100. The embryos have 1, 3, 4, or 5 distinct cotyledons, several of which have doubled lobes.—2. *Vegetative anomalies*. These include leaves with many points but with acuminate lateral expansions; also many which are undulated and strongly honeycombed. Some stalks manifest a tendency to fasciation with enlarged flattened branches and notable increase in density of leaves.—3. *Double flowers; proliferous shaded petals*. Next to the calyx is found a whorl of petals. The axis of the flower is elongated and bears a wreath of 10 or 11 petaloid pieces in 2 whorled series, following a novel lengthening of the axis and novel petaloid wreath. This phenomenon is repeated 6 times. All flowers of the stalks are double and sterile. The

percentage of double stalks ranges from 10 to 100.—4. *Double flowers by proliferation of the pistil*. In this type sepals, pistils, and stamens are formed normally but the pistil arises in a new flower, fitting in the first. The pistil of the 2nd type arises in turn in flower of third kind, etc. All flowers of the abnormal stalks are double.—5. *Plurivalved fruits*. Certain stalks have fruits usually pluricarpellate, giving 3, 4, or 5 petals with stigma having 3, 4, or 5 lobes. Some variations are present and not all fruits are aberrant; some fertile seeds are formed in both normal and pluricarpellate fruits.—6. *Intercarpellary flowers*. The anomaly is manifested in the first flowers by the presence of 3-4 carpels in the pistil, supplied with 3 to 4 stigmatic lobes. Seeds formed from these are capable of germination. The oldest flowers at the middle of the inflorescence have pistils alike but ovary forms a veritable intercarpellary flower. It is attached rather high on the placenta, which bears above and beneath it the atrophied but easily recognizable ovules. The intercarpellary flower thus gives proof of abnormal development in the ovule. The very small flower is complete with well formed sepals, petals, and stamens. The arrangement of parts, except as to number of members, is normal. Stamens are frequently devoid of pollen. The small pistil has always more than 2 carpels. One of the ovules instead of being rounded shows 3-4 lateral nipples. The anomaly persists even to the last flowers of the inflorescence.—These multiple anomalies and others not here noted are manifest in various directions in the organs, appearing more or less developed in each generation and show that there is a genuine and very intensive defect in this line of wall flowers. The author proposes to seek the cause of these hereditary variations and to determine the extent to which they can be fixed.—*C. E. Myers*.

1332. GARDNER, V. R. Bud selection, with special reference to the apple and strawberry. Missouri Agric. Exp. Sta. Res. Bull. 39. 30 p. 1920.—Apple trees grown as bud selections from high-yielding parents averaged about the same in yield as those from low-yielding parents. Selections from strawberries of high and low yield did not produce in general new strains of high- or low-yielding ability. The author notes a "running out" or "degeneration" in some bud selections. This is of 3 types: (a) Loss of ability to produce fruit; (b) loss of ability to produce runners; (c) reduction in general vegetative vigor. It is suggested that bud selection may be used as a means of keeping plants up to standard. There is also noted a case (which the author considers as reversed dominance) in which parental characters are changed in the offspring.—*F. R. Clark*.

1333. GEBHARDT, CURT. Die Grossknolligkeit der Kartoffelzüchtungen. [Largeness of tubers in potato breeding.] Zeitschr. Pflanzenzücht. 8: 85-88. 1921.—In a study of potato varieties, the writer found the number of large and small tubers produced by healthy and uninjured plants to be a varietal characteristic. Data are given in tabular form on the performance of 8 varieties.—*Richard Wellington*.

1334. GOLDSCHMIDT, RICHARD. Kleine Beobachtungen und Ideen zur Zellenlehre. III. Die Bedeutung der atypischen Spermatozoen. [Minor observations and ideas on cytology. III. The significance of atypic spermatozoa.] Arch. Zellforsch. 15: 291-300. 1920.—Previous observations had not shown that atypic spermatozoa function in fertilization, nor that they related to sex determinations, nor that they have any other function. The author describes experiments indicating that atypic spermatozoa are functionless, as follows: Male gipsy moths with low degree of intersexuality produce chiefly normal spermatozoa, while those with a high degree of intersexuality produce mostly atypic spermatozoa. Females mated with these intersexual males laid eggs; when high-grade intersexual male was used no larvae resulted (indicating that eggs were not fertilized), when medium intersexual male was used a few larvae developed, and when low-grade intersex was used larvae developed in normal numbers.—The production of atypic spermatozoa accompanies degenerative changes of other kinds, occurs to a high degree in transplanted testes, and is referred by the author to physico-chemical causes.—*A. Franklin Skull*.

1335. HAMMARLUND, C. Über die Vererbung anormaler Ähren bei *Plantago major*. [Inheritance of abnormal spikes in *Plantago major*.] Hereditas 2: 113-142. 7 fig. 1921.—Four



forms of plantain are concerned: (1) The normal form with long simple spikes and small bracts; (2) a form with branched spikes; (3) a form with bracts replaced by leaves, the spike being thus pyramidal; and (4) a form with bracts replaced by leaves and spike shortened to a rosette. All these were self-fertile.—Branched by normal gave normals in  $F_1$ . In  $F_2$  the ratios varied in different families, but selfed branched plants gave progenies with varying percentages of apparent normals. In the 2nd year, however, these same  $F_2$  plants showed approximately 3 normals to 1 branched. This ratio was confirmed by a full  $F_3$ .—Pyramidal by normal gave normals in  $F_1$ . In  $F_2$  the proportion was 12 normals to 3 rosetted to 1 pyramidal. Many seedling rosette plants perish prematurely unless special precautions are taken; and pyramidal are slightly less viable than normals. This proportion was confirmed by a full  $F_3$ .—*John Belling.*

1336. HANCE, ROBERT T. [Rev. of: KUWADA, Y. *Die Chromosomenzahl von Zea Mays L. Ein Beitrag zur Hypothese der Individualität der Chromosomen und zur Frage über die Herkunft von Zea Mays L.* (The chromosome number of Zea Mays L. A contribution to the hypothesis of the individuality of chromosomes and to the problem of the origin of Zea Mays L.) Jour. Coll. Sci. Imp. Univ. Tōkyō 39: 1–148. 2 pl., 4 fig. 1919 (see Bot. Absts. 4, Entry 643).] Amer. Nat. 55: 268–275. 1921.

1337. HANSEN, W. *Die Ermittlung des Einzelkorngewichtes einer Pflanze.* [Determination of the weight of individual grains of a plant.] Zeitschr. Pflanzenzücht. 7: 225–227. 1920.—Determinations of the average weight of wheat grains based upon 2 samples of 50 each closely parallel the average weights of 1000 kernels and are considered a better measure for the purpose of selection than the average weight based upon all the seeds which the plant produces. Factors which increase the number of grains per plant tend to make the weights of individual seeds less. The taking of sub-samples by selecting the larger kernels is considered to give a truer indication of the size of seed. The same method applies with oats and only the upper seed in each spikelet need be considered.—*D. F. Jones.*

1338. HANSEN, W. *Die Mahndorfer Pflanzenzüchtung bzw. das Mahndorfer Usancenbuch.* [The Mahndorf plant breeding or the book of Mahndorf methods.] Zeitschr. Pflanzenzücht. 7: 283–318. 5 fig. 1920.—The author describes the development and application of the plant breeding methods in use at Mahndorf, dedicated to Mr. HACKE at the celebration of his 25 years of service as administrator. Following the results of BESELER and RIMPAU in Germany and the Svalöf Station in Sweden, the individual-plant-selection method was started in 1902 with peas and wheat. Attention has been chiefly confined to single varieties of the principal crops,—rye, winter wheat, summer wheat, barley, oats, and peas,—and in addition some work has been done with alfalfa, turnips, maize, poppy, rape, carrots, and grass. The principal qualities of the improved strains of these plants are stated, together with detailed descriptions of the methods of planting, arranging the plants in the field, harvesting, and recording results.—*D. F. Jones.*

1339. HARRIS, J. ARTHUR, AND F. G. BENEDICT. *The variation and the statistical constants of basal metabolism in men.* Jour. Biol. Chem. 46: 257–279. 1 fig. 1921.—This paper presents: (1) A measure of the variability of the basal metabolism of the normal individual; (2) a consideration of the relation between the length of time over which the observations extend and the variation in the metabolism of the individual; and (3) a consideration of the most suitable method for determining the population mean from measurements on a series of individuals. The results show significant ranges and standard deviations of metabolism (C. V. about 4 per cent). The variability in metabolism of the individual is positively correlated with duration of the period of time over which the observations have been distributed. The population constant derived from individual means is less modified by weighing than that deduced from individual minima. Weighing by method of means and on the basis of the square root of the number of days covered by observations is suggested.—*John W. Gowen.*

1340. HARRISON, J. W. HESLOP. The inheritance of size in the crosses involving *Oporabia autumnata* and *O. filigrammaria*. *Vasculum* 7: 49-56. 1921.—Mean wing length of the ♂ in the geometrid subspecies *O. autumnata* is 18 mm., in *O. filigrammaria* 16 mm. (81 and 91 individuals respectively). Arranged in groups based on 0.5 mm. differences, the larger species has its mode in "Class 10"; the smaller in "Class 6." Both  $F_1$  and  $F_2$  hybrids are intermediate, with modes in "Class 7" (means, 16 mm. and 16.85 mm.).  $F_1$  parents of mean size gave  $F_2$  showing no increased, but rather lessened, variability, that is, with 4.9 as the coefficient of variation as compared with 5.1.  $F_3$  from unselected and mixed  $F_2$  parents tends to resemble  $F_2$  in size with slightly increased variability (especially true of ♀♀), both in certain individuals showing intermediate coloration and in others constituting a peculiar group of segregates as to color. Back-crosses similarly lend no support to the multiple-factor hypothesis, fluctuating about means intermediate between those of the 2 pure types (that is, 16.5 mm.—17.5 mm. in back-crosses, as compared with 16 mm.—18.1 mm. in pure types) and within narrow ranges. A comparative study of the ♂♂ of the various families under consideration corroborated the conclusions drawn from the examination of the ♂♂.—The results are "opposed to the multiple-factor theory of size determination unless it be granted that such factors do not segregate pure in gametogenesis but rather enter the  $F_1$  gametes in an average or contaminated condition."—J. H. Gerould.

1341. HARTWELL, BURT L. Thirty-first annual report of the Director of the Rhode Island Agricultural Experiment Station. *Bull. Rhode Island State Coll.* 14: 57-65. 1919.—"The inheritable character to lay large eggs is not joined with high annual production; but a high percentage increase in egg-weight, usually during April and September, does appear to be associated with high annual production in numbers, at least for the first year."—Reciprocal crosses between heavy Cornish fowl and light-weight Hamburgs are reported as having been made in 1918 but results are not given.—William A. Lippincott.

1342. KELLEY, F. J. Substitutes for the words homozygous and heterozygous. *Science* 50: 458-460. 1919.—The common non-technical substitutes, pure, pure-bred, impure, mixed, hybrid, mongrel, cross-bred, are descriptive of origin. MENDEL himself used "constant" in the sense of homozygous. This term is not subject to the above objection, and inconstant may suitably be used for heterozygous.—John Belling.

1343. KNIBBS, G. H. The theory of large population-aggregates. *Metron* 1: 113-125. 1920.—The tendency of population to increase in geometrical progression may be modified by other factors coming into operation. The rate of increase is affected by the natural resources of the country, by technical skill, and by the standard of living. The possible density of population is limited. The curve  $T = k t^{m-n}$  is suggested to describe the increase and ultimate decrease of population. Pressure of population produces war.—John Rice Miner.

1344. KNIGHT, L. I. Physiological aspects of self-sterility of the apple. *Proc. Amer. Soc. Hort. Sci.* 14: 101-105. 1917 [1918].—In self-pollinated Rome Beauty apples the pollen germinates properly, so that self-sterility is not due to pollen sterility. Asparagin present on the style does not retard growth; it has an accelerating effect in artificial cultures of pollen. The maximum growth of Rome Beauty pollen tubes in artificial cultures exceeded the length required to reach from the stigma to the egg when Rome Beauty flowers are self-pollinated. The maximum length of 10 mm. was attained by about 5 per cent of the tubes in 2 days, the required length for Rome Beauty styles being 7 mm. Pollen is not sensitive to excess moisture since Rome Beauty pollen germinates well in distilled water. No mechanical obstruction to the growth of pollen tubes was found. When Rome Beauty was pollinated with Jonathan, the pollen tubes traversed the length of the style in 48 hours whereas tubes from Beauty pollen were still growing in the style at the end of 120 hours when kept at a moderate temperature; at higher temperatures, 80-90° F., 24 hours only were required to traverse the style in selfed Rome Beauty. At the end of 120 hours the egg cell begins to disintegrate, inhibiting fertilization. The relatively slow rate of growth of Rome Beauty pollen tubes in Rome Beauty stylar tissue is suggested as an important factor in the self-sterility of that



variety, egg disintegration beginning before fertilization can take place. More rapid tube growth at higher temperature may explain self-fertility under certain climatic conditions in varieties which are usually self-sterile.—*J. P. Shelton.*

1345. LATHOUWERS, V. Variations speltoides dans des lignées pures de Froment et dans une population d'Epeautre. [Speltoid variations in pure lines of wheat and in a population of einkorn.] Bull. Soc. Roy. Bot. Belgique 54: 218-223. 1921.—In 1919 in 2 pure lines belonging to different varieties of wheat, under observation since 1913, 2 aberrant plants were found, having the same aspect as those described by NILSSON-EHLE of Svalöf under the name "speltoid mutations." The author studied the 2nd generation of these, besides an aberrant plant in a "population" of einkorn. His observations did not permit him to draw any definitive conclusion. He hopes that the 3rd generation will demonstrate whether mutation or spontaneous hybridization has occurred.—*Henri Michiels.*

1346. LILLIE, FRANK R. Studies of fertilization. IX. On the question of superposition of fertilization on parthenogenesis in *Strongylocentrotus purpuratus*. Biol. Bull. 40: 23-31. 1921.—In a series of carefully controlled experiments, the author shows that eggs of *Strongylocentrotus purpuratus*, which have formed membranes as a result of treatment with butyric acid, are usually incapable of fertilization with sperm even though the membranes are destroyed by shaking immediately after they have been formed; exceptions (1-5 per cent) are explained by the assumption that the reaction after treatment with butyric acid is incomplete. The membrane reaction following butyric acid is the same as that following insemination; this is shown by similarity of the membranes formed in the 2 cases, and by the fact that the rate of formation is "the same.—*Bertram G. Smith.*

1347. LINDSTROM, E. W. Concerning the inheritance of green and yellow pigments in maize seedlings. Genetics 6: 91-110. 1921.—The author analyzes the inheritance of 3 colors in the seedling leaves of maize. These colors are known as white, virescent, and yellow, and the factor pairs are designated *Ww*, *Vv*, and *Ll*. These 3 leaf-color factors are found to be independent in inheritance and in addition the *Ll* factor pair for yellow leaves is found to be closely linked with the *Rr* factor pair for the aleurone color of the seeds. There is but 1.6 per cent of crossing over between the *Ll* and *Rr* factors.—*J. H. Kempton.*

1348. LOTSY, J. P. *Oenothera*-proeven in 1919. [Oenothera experiments in 1919.] Genetica 2: 385-399. 1 pl., 3 fig. 1920.

1349. LOVE, JAMES KERR. The origin of sporadic congenital deafness. Jour. Laryngol. Rhinol. and Otol. 35: 263-270. 1920.—The paper undertakes to show that "sporadic congenital deafness is hereditary and that such heredity is Mendelian." The subject is discussed theoretically, and cases are cited to show that the deafness behaves as a Mendelian recessive. A chart of "The Ayrshire Family" gives a concrete illustration and shows 5 affected generations descended from a common ancestor 3 generations further back. The family is Scotch but has branches in America and Australia.—*Howard J. Banker.*

1350. MACDONALD, ARTHUR. Scots and Scottish influence in Congress. Metron 1: 140-155. 1920.—A brief description is presented of the racial constitution of the Scotch and their characteristics emphasizing especially their "independence, persistence, and zeal for education," fearlessness, and family feeling. These qualities are illustrated by the performances of Scotch immigrants to the U. S. A. and the many Scotch political leaders in American history. Then follows a statistical analysis of the Senate of the 62nd Congress of the U. S. A. and its legislative work showing the leadership of the Scotch constituency. The paper closes with a comment on the decreasing number of great statesmen, attributing this to the increase in complexity of the environment through social inheritance "while our inherited natures remain unchanged," "social heredity has outrun germinal heredity."—*Howard J. Banker.*

1351. MARCHAL, E. Recherches sur les variations numériques des chromosomes dans la série végétale. [Studies on the numerical variations of the chromosomes in plants.] Mem.

Acad. Roy. Belgique Cl. Sci. Ser. II. 4: 1-108. 4 pl., 24 fig. 1920.—This work, describing the results of the author's cytological studies on *Campanula* and the Compositae Liguliflores, is largely a critical review of the chromosome number reported for the various groups of the plant kingdom. He concludes that there is no absolute relation between chromosome number and plant complexity (taxonomic position), but that there appears to be a suggestive relation between the chromosome number of plants nearly related, that is, plants within a taxonomic group may possess chromosome numbers that may be arranged in geometrical or arithmetical progression, indicating, possibly, a common ancestry which has given rise to the new forms through chromosomal mutations of one kind or another. The usual methods by which the chromosome number may be permanently modified are discussed. The volume and the dimensions of chromosomes are very briefly considered. That markedly different plant forms may possess chromosome complexes alike as far as number is concerned is intelligible to the author in the light of the different physiological effects produced by bacteria morphologically similar.—*Robert T. Hance.*

1352. MINOURA, TADACHIKA. A study of testis and ovary grafts on the hen's egg and their effects on the embryo. Jour. Exp. Zool. 33: 1-61. 10 pl. 1921.—Following the grafting of pieces of ovary (or testes) upon the embryonic membranes of developing chickens, deviations from the normal in the reproductive systems of the hosts were observed in some instances, pointing toward the production of hormones by the engrafted gonad capable of modifying the development of the primary sex organs along the lines suggested by LILLIE in accounting for the free-martins.—*H. D. Goodale.*

1353. MIYAZAWA, B. Studies of inheritance in the Japanese *Convolvulus*. Part II. Jour. Genetics 11: 1-15. 1 colored pl. 1921.—The previous article states that yellow-leaved plants never bear dark red flowers, but recently the author has obtained a yellow-leaved race with dark red flowers. Various crosses are described with data, and the streaking on solid colored flowers and the correlations of leaf and flower colors are noted. The observations are interpreted on a factorial basis.  $G$  = gene for green color in leaf;  $D$  = dark red flower color when the accompanying  $G$  is homozygous;  $B$  = blue color;  $M$  = modifier of tone of flower color both in homozygous and heterozygous condition. Summary: (1) Light magenta color in  $F_1$  is produced when both  $G$  and  $D$  are in heterozygous condition and bluing gene  $B$  and modifying gene  $M$  are brought in from parent A. (2) Reciprocal hybrids are similar to each other in all respects. (3)  $D$  produces dark red colors when  $G$  is present in homozygous condition but dark red (magenta and scarlet) when  $G$  is heterozygous or absent. Such an interrelation between  $G$  and  $D$  is found only in hybrids between plants A and B and does not exist in other hybrids though C has colors closely related to those of B. (4) The fact that D has such a character is seen from results in which all 3 families of offspring of a hybrid which is green, white and yellow, and deep scarlet, respectively, produced dark red colors. (5) The effects of  $B$  are not manifested in individuals which are in the homozygous condition with respect to  $G$ . (6) Magenta color appears in plants which have the constitution  $DB$ , either  $Gg$  or  $gg$  being present at the same time. On the contrary, scarlet appears only in plants which are in condition  $Db$ . (7) White appears in individuals when  $D$  is absent and then  $G$ ,  $B$ , and  $M$  may be in any condition. (8) Interrelations between  $D$  and  $M$  are as follows:  $DdM$  = light color;  $DD$  = medium color;  $DDmm$  and  $Ddmm$  = deep color. (9) Magenta color is dominant over scarlet and dark red, and scarlet dominant over dark red. (10) There may exist homozygous plants with respect to flower color with medium and deep tones of magenta, scarlet, and dark red, but the authors have found no individuals with light tones of these colors.—*E. E. Barker.*

1354. MOHR, OTTO L. A case of hereditary brachyphalangy utilized as evidence in forensic medicine. Hereditas 2: 290-298. 10 fig. 1921.—The publication deals with a paternity case in which the author had to give an opinion as medical expert. The man upon whom an illegitimate child had been fathered denied the parentage. It was found that he suffered from a pronounced case of a dominant hereditary brachyphalangy affecting the 2nd row of phalanges on the II-IV fingers and toes; thumbs were normal but the basal phalanx of big toes was shortened. The child's hands and feet exhibited an exactly similar malformation. Com-



parison of the radiographs revealed an absolute correspondence, even in details between the man's and the child's type of brachyphalangy. The possibility of the mother being acquainted with other brachyphalangious men could be excluded, and the conclusion given in the case was positive. The man, according to the judgment passed, was found to be the father of the child mentioned.—*Otto L. Mohr*.

1355. MOHR, OTTO L. En arvelig misdannelse som bevismiddel i en farsskapsak. [A hereditary malformation as evidence in a paternity case.] Tidsskr. Norske Laegefor. 40: 521-529. 6 fig. 1920.—A short account is presented of the case mentioned in the preceding abstract.—*Otto L. Mohr*.

1356. MOORE, CARL R. On the physiological properties of the gonads as controllers of somatic and psychical characteristics. III. Artificial hermaphroditism in rats. Jour. Exp. Zool. 33: 129-171. 15 fig. 1921.—Grafts of an ovary (or testis) into a hemicastrated animal of the opposite sex were successfully made (persisting at least 8½ months) without evidence of deleterious influence on the host's somatic or psychical characteristics, nor was there evidence of an antagonism between the 2 unlike gonads.—*H. D. Goodale*.

1357. MORISHIMA, KAN-ICHIRO. Variations in typhoid bacilli. Jour. Bacteriol. 6: 275-323. 1921.—Alterations induced in the fermentation of arabinose, dulcitol, glycerol, inositol, raffinose, rhamnose, salicin, and xylose, as well as alterations occurring in artificial environment in reference to the production of acid and alkali, in agglutination, and the formation of "daughter colonies," should be regarded as variants and not as deVriesian "mutations."—*Andrew I. Dawson*.

1358. NACHTSHEIM, HANS. Die Bestimmung des Geschlechtes bei Dinophilus. [The determination of sex in Dinophilus.] Sitzungsber. Ges. Morphol. Physiol. München 1919: 46-53. 1920.

1359. NACHTSHEIM. [German rev. of: MORGAN, THOMAS HUNT. The physical basis of heredity. 14 × 21 cm., 300 p., 117 fig. J. B. Lippincott Co.: Philadelphia, 1919 (see Bot. Absts. 5, Entry 422; 7, Entry 938).] Zeitschr. Indukt. Abstamm.- u. Vererb. 26: 176-178. 1921.

1360. NILSSON-EHLE. [German rev. of: FRUWIRTH, C., TH. ROEMER, UND E. VON TSCHERMAK. Handbuch der landwirtschaftlichen Pflanzenzüchtung. 4. Die Züchtung der vier Hauptgetreidearten und der Zuckerrübe. (Handbook of agricultural plant breeding. 4. Breeding of the four chief cereals and the sugar beet.) 3rd ed., 8 vo., xv + 504 p., 42 fig. Paul Parey: Berlin, 1918 (see Bot. Absts. 6, Entry 1031).] Zeitschr. Indukt. Abstamm.- u. Vererb. 26: 175-176. 1921.

1361. [PALMER, E. F.] Report of the Ontario Horticultural Experiment Station, Vineland Station, Ontario. 1918: 1-40. 1919.—The "Plant Breeding Report" occurs on pages 9-21, and is devoted mainly to the progress of fruit and vegetable breeding projects. A few Early Crawford peach seedlings which had fruited were apparently worthless, while a Leamington self-fertilized seedling showed much promise. Seedlings of *Rubus occidentalis* and Gregg (black raspberry) came so true to type that it is deemed feasible to propagate black-caps by seed. Slight variations were noted in the degree of thorniness, habit of fruiting, and size and quality of the fruit in 410 seedlings of *Rubus strigosus* (wild red raspberry). All seedlings, 140 in number, of *Rubus occidentalis* (wild black) × *Rubus strigosus* (wild red) possessed characters of both species and bore purple fruits; while 230 plants of the reciprocal cross possessed wild red raspberry foliage and thornier canes than the red raspberry and bore red fruits that were drier and firmer than the wild red. Seedlings, 152 in number, of Gregg × Cuthbert (red raspberry) gave 117 intermediate purple-fruited types, 28 black caps, and 7 red raspberries, or an approximate ratio of 1 red to 4 blacks to 16 purples. The purples varied in thorniness from very thorny to almost smooth, while the black caps resembled the Gregg and the red the Cuthbert as regards thorniness. The reciprocal cross, Cuthbert × Gregg,

gave all red raspberries. Crosses were also made between Cuthbert and blackberry, loganberry and raspberry, currant and gooseberry, and European and American gooseberry. The report closes with a statement of the objects sought in breeding corn, cucumbers, egg plant, peppers, garden peas, potatoes, and tomatoes.—*R. Wellington.*

1362. PEASE, M. S. [German rev. of: STAKMAN, E. C., J. H. PARKER, AND F. J. PIEMEISEL. Can biologic forms of stem rust on wheat change rapidly enough to interfere with breeding for rust resistance? Jour. Agric. Res. 14: 111-124. 5 pl. 1918 (see Bot. Absts. 1, Entry 500; 2, Entry 397).] Zeitschr. Indukt. Abstamm.- u. Vererb. 26: 179-180. 1921.

1363. PÉZARD, A. Numerical law of regression of certain secondary sex characters. Jour. Gen. Physiol. 3: 271-283. 8 fig. 1921.—The rate at which the comb of a castrated cock shrinks is expressed by a parabola having the formula  $L = l + \frac{1}{2} C (\vartheta - t)^2$ , where  $L$  is final length of comb,  $C$  a constant for each individual,  $\vartheta$  duration of shrinkage,  $l$  length of comb at some particular time,  $t$ . It was also noted that  $C \vartheta$  is nearly constant.—*H. D. Goodale.*

1364. PICKETT, B. S. Correlations between fruit and foliage in strawberries. Proc. Amer. Soc. Hort. Sci. 14: 56-59. 1917 [1918].—A summary of the relationship between (1) the average weight of berries and average area of leaflets, (2) the total production of fruit and total area of the foliage, (3) the number of leaves and the number of berries, is presented for 900 seedlings, the progeny of crosses of 17 varieties of strawberries. The correlation between (1) number of leaves and berries was  $.4792 \pm 0.0022$ , (2) average area of the leaflets and average weight of fruit  $0.28904 \pm 0.00456$ , and (3) total area of foliage and total weight of fruit  $0.7503 \pm 0.0012$ . It was concluded that it was not practical to use these correlations as a basis of eliminating strawberry seedlings.—*W. D. Valleau.*

1365. PUNNETT, R. C., AND P. G. BAILEY. Genetic studies in poultry. III. Hen-feathered cocks. Jour. Genetics 11: 37-57. Pl. 7-11, 2 fig. 1921.—The authors accept for the present MORGAN's theory that hen-feathering in the cock is due to the presence of luteal cells. They regard hen-feathering in cocks to be the result of a single factor, which, however, is distinct from the one that produces the normal hen plumage. The former is transmitted equally to both sexes, the latter only to females. The factor producing hen-feathering in males is dominant, but intermediate forms occur among heterozygotes. These, in their 1st year's plumage, may resemble very closely normal males, but in the succeeding moult take on almost entirely the plumage of the hen-feathered males.—*H. G. May.*

1366. RASMUSON, HANS. Beiträge zu einer genetischen Analyse zweier *Godetia*-Arten und ihre Bastarde. [Contribution to a genetical analysis of two *Godetia* species and their hybrids.] Hereditas 2: 143-289. 1 pl., 29 fig. 1921.—Results are described of varietal and specific crosses in *Godetia Whitneyi* and *G. amoena*. The work was begun in 1917 with commercial seed. The procedure involved crosses between types of unknown genotype. Parental plants were selfed in each case. In the event of segregation of selfed plants their progeny was further tested during the next 2 seasons. The progeny of crosses was also carried through to  $F_2$  and in some cases to  $F_3$ . The number of differential characters is considerable and some of the phenotypes are highly modifiable, making their separation uncertain. The populations were in general small. The interspecific hybrids were almost completely sterile, though enough  $F_2$  plants were secured in some cases to show that the genes behave in the same manner as in varietal crosses. For these reasons the author's conclusions are put forward in some cases with caution. The characters studied were color, size, and doubleness of corolla, color and shape of leaves, and habit of growth of plant. Heritable differences were demonstrated for all these characters and a factorial analysis proposed for the following: (1) *G. Whitneyi*. (a) *aa* plants have yellow-margined petals; (b) *B* plants in the absence of other dominant color genes have pale violet-colored petals; (c) *C* in place of *B* gives rose varying to nearly white; (d) *D* alone has no effect, but with *B* or *C* produces lilac; (e) *E* produces red petals; (f) *F* with *E* gives red with light-margined petals but alone has no effect; (g) *G* produces a red spot in the middle of the petal; (h) *H* enlarges the set but alone is without effect; (i) *I* gives,



probably with *B* only, rose-lilac. (2) In *G. Whitneyi* it was shown that *aa* plants have smaller corollas, though it is probable that other genes are also concerned in corolla length. (3) Segregation was shown in this species, but the factors were not definitely determined for light and dark green leaves, long narrow *versus* short broad leaves, and low dense growth habit *versus* taller lax type. The latter is probably a simple genetic difference due to gene *R*. (4) Linkage relations suggest that the *B*, *E*, and *G* allelomorphic pairs are in the same chromosome pair. The crossover percentage for the *B* and *E* pair was figured at 14.3 per cent. *C* and *F* genes are thought also to be linked but in a 2nd chromosome pair. (5) In *G. amoena* a pure variety was found with a large spot on the petals not reaching to the base ("Querfleck"), and another with a small basal spot. Types with both spots when selfed gave 1 "querfleck": 2 double-spot: 1 basal spot. Both types of spots give 3:1 ratio with unspotted *Whitneyi* varieties. The author suggests either multiple allelomorphism or close linkage, preferring for the present the latter. (6) Double is dominant to single (gene *U*) but is influenced in *G. amoena* by factor *L* or *K* concerned with spotting. Basal-spot flowers (*Lg Lg*) are more double than double-spotted ones (*Lg lG*) and these more double than "querfleck" (*lG lG*). (7) No *Oenothera*-like phenomena were found and interspecific crosses behaved like varietal ones in respect to flower color, doubleness of flower, and growth form of plant, at least in so far as the small progenies permit a decision.—*Leonas L. Burlingame*.

1367. RASMUSON, HANS. On some hybridization experiments with varieties of *Collinsia* species. *Hereditas* 1: 178-185. 1 fig. 1920.—A white-flowered variety of *Collinsia bicolor* was crossed with the normal type having lilac on the under lip and being whitish on the upper. *F*<sub>1</sub> plants were lilac, and in *F*<sub>2</sub> segregation of 9 lilac to 7 white was observed. Green stem was recessive to red, and the *F*<sub>2</sub> ratio was approximately 9 red: 3 slightly tinged with red: 4 green. An *A* factor is assumed which produces white flowers and red-tinged stem, and a *B* factor which causes white flowers and green stem. *AB* gives lilac flowers and red stem, and *ab* gives white flowers and green stem. A variegated plant of *C. tinctoria* crossed with the self-colored type gave 3 self to 1 variegated in *F*<sub>2</sub>. One-fourth of the variegated plants were yellow and non-viable. A gene, *I*, is postulated which increases the amount of green in variegated plants. The yellow plants are assumed to be *ii*. Spots on the upper lip of the flower of *C. tinctoria* proved to be a simple Mendelian dominant condition.—*A. C. Fraser*.

1368. RAUM. Weissblühender Rotklee eine "umschlagende Sippe?" [White-flowering red clover, an "ever-sporting variety?"] *Zeitschr. Pflanzenzücht.* 8: 73-77. 1921.—Seeds of open-pollinated white-flowering heads of red clover produced 0.8 per cent white-flowering plants, presumed to have arisen through geitonogamy, produced seed unguarded but geographically isolated. Of 200 offspring only 11, or 5 per cent, came white. Seed from 48 red-flowered plants descended from white-flowered plants produced white-flowered plants in only 19 of the 48 families to the extent of 41 white to 231 red. Some intermediacy was evidenced by flower color. The author believes that the data warrant the conclusion that white-flowering red clover is an ever-sporting form comparable in some ways to four- and five-leaved ever-sporting strains of red clover. The problem is considered of economic importance. [See also Bot. Absts. 9, Entry 1329.]-*L. R. Waldron*.

1369. REGAN, W. M. Breeding experiments with dairy cattle. New Jersey Dept. Agric. Bull. 24. 323-326. 1920.—The author describes breeding experiments now in progress, the object of which is to determine the value of inbreeding, line-breeding, and out-breeding in improving dairy cattle. It is also planned to attack the questions of "nicking" and inheritance of milk secretion.—*E. Roberts*.

1370. RHODES, ROBERT CLINTON. Binary fission in *Collodictyon triciliatum* Carter. Univ. California Publ. Zool. 19: 201-274. Pl. 7-14, 4 fig. 1919.—The author presents a detailed account of *Collodictyon triciliatum*, free-living flagellate reproducing solely by binary fission. An extended discussion is given of its affinities based on the form of mitosis, of which full descriptive account is given.—*R. E. Clausen*.

1371. ROBERTSON, ELIZABETH. Notes on breeding for increase of milk in dairy cattle. Jour. Genetics 11: 79-90. 1921.—A study was made of the methods of breeding Kerry cattle in relation to increase in milk and fat production. The conclusion was reached that milk and fat are increased by inbreeding to a male relationship and decreased by breeding to a female relationship. By male relationship the author means "the mating of a bull with a cow which is so related to him that their first common ancestor is a bull." If the first common ancestor is a cow it is called a female relationship.—*E. Roberts.*

1372. SCHIEMANN, E. [German rev. of: (1) CORRENS, C. Die geschlechtliche Tendenz der Keimzellen gemischtgeschlechtiger Pflanzen. (Sex tendency of germ-cells in plants of mixed sex.) Zeitschr. Bot. 12: 49-60. 2 fig. 1920 (see Bot. Absts. 8, Entry 1066). (2) WETTSTEIN, F. VON. Künstliche haploide Parthenogenese bei *Vaucheria* und die geschlechtliche Tendenz ihrer Keimzellen. (Artificial haploid parthenogenesis in *Vaucheria* and the sexual tendency of the germ-cells.) Ber. Deutsch. Bot. Ges. 38: 260-266. 2 fig. 1920 (see Bot. Absts. 9, Entry 777).] Zeitschr. Indukt. Abstamm.- u. Vererb. 25: 255-256. 1921.

1373. SLOCUM, ROB. R. Standard varieties of chickens. II. The Mediterranean and continental classes. U. S. Dept. Agric. Farmers' Bull. 898. 27 p., 22 fig. 1920.—The author gives simple descriptions based on the American Standards of perfection, but does not go into as great detail. The bulletin is intended for the use of small poultrymen and farmers who keep some poultry. Under the Mediterranean classes are described the Leghorns, Minorcas, Anconas, Spanish, and Blue Andalusian; under the continental classes, the Campines.—*H. G. May.*

1374. SMALL, JAMES. The origin and development of the Compositae. Chap. XI. The origin of the Compositae. New Phytol. 18: 65-89. Fig. 41-55. 1919.—Theories of evolution are discussed under the following headings: Natural selection, mutations, orthogenesis, epharmosis, isolation, and differentiation. The author concludes that "In evolution by orthogenetic saltation, with epharmosis and elimination of the unfit,—we have the best of Darwinism, neo-Lamarckism, neo-vitalism, Mendelism, and the mutation theory." Orthogenetic saltation is looked upon as determining the inner constitution of a species, the expression of that constitution being modified by epharmosis. Mendelian segregation is stated as having most evidence to support it as an originating cause of a large number of taxonomic species or even genera. The Lobelioideae are considered to be the ancestral group from which Compositae have been derived. A picture is given of the transformation of a tropical, arborescent species of *Siphocampylus* to an Andean species with all the essential characters of a *Senecio*. [See also Bot. Absts. 3, Entry 1142].—*T. H. Goodspeed.*

1375. STIEVE, H. Verjüngung durch experimentelle Neubelebung der alternden Pubertätsdrüse, von E. Steinach. [Rejuvenation through experimental revitalization of senile sex glands, of E. Steinach.] Naturwissenschaften 8: 643-645. 1920.—Stieve points out the need of caution in accepting STEINACH's results, calling attention to certain contradictory evidence.—*H. D. Goodale.*

1376. TSCHERMAK, ERICH VON. Beiträge zur Vervollkommnung der Technik der Bastardierungszüchtung der vier Hauptgetreidearten. [Contributions to the perfection of the technique of hybridization in the four chief species of cereals.] Zeitschr. Pflanzenzücht. 8: 1-13. 7 fig. 1921.—This paper describes the physical conditions of the spikelets of rye, wheat, barley, and oats at the season of flowering. The author gives in some detail the technique used in making cross-pollinations within each sort and the climatic conditions necessary to success.—*F. P. Bussell.*

1377. TUFTS, W. P. Selection of deciduous fruits. Univ. California Jour. Agric. 6: 14, 15, 28, 29, 30. 1920.—Practically all deciduous fruits are said to be benefited by cross-pollination. Apples, almonds, cherries, figs, filberts, nectarines, peaches, pears, and plums may be divided into self-sterile and self-fertile groups. Varieties of deciduous fruits best suited to California conditions are recommended.—*T. E. Gaty, Jr.*



1378. UBISCH, G. VON. *Anwendung der Vererbungsgesetze auf die Kulturpflanzen.* [Application of laws of heredity to cultivated plants.] *Naturwissenschaften* 8: 293-299. 1920.—The application of laws of heredity to improvement of cultivated plants is discussed. The author points out the intimate interrelations of theory and practice. The term Mendelian character is used in a special sense to refer to character differences between individuals and races. Difficulties are met with which are dependent upon the effect of environment on the development of characters, existence of complex factor relations in what appear to be simple character contrasts, and the occurrence of linkage phenomena. Linkage is especially important in practical work because it may greatly increase the difficulty of securing desired combinations of factors. Correlations are physiological and should not be confused with linkage phenomena, which depend upon the location of factors in the same chromosome.—Intelligent plant breeding must take account of biological relations in different plants, particularly features connected with blooming and setting of seed. When plants are propagated vegetatively seed constancy is not necessary, and a highly heterozygous condition may be desirable on account of its stimulating effect. Different treatments are accorded seed plants depending on whether they are self-fertilized, cross-fertilized, or self-sterile. Genetic analysis is most readily accomplished in a self-fertilized plant, and illustrative details are given for wheat, oats, and barley. Rye is mostly self-sterile, consequently breeding to an absolutely homozygous condition is impossible. In potatoes self-sterility, low fertility, and degeneration following self-fertilization are hindrances to success in breeding, but statements in the literature cannot be accepted without reservations. There is a possibility of attaining immunity to disease by crossing with wild species. Degeneration in potatoes should be a subject for future solution. In sugar beets genetic analysis is particularly difficult because of the influence of external conditions. The aim of sugar beet breeding is to combine high sugar content with high weight, a very difficult task because both characters are determined by a series of multiple factors. The sugar beet may be crossed with other beet derivatives.—The possibility of improvement depends upon genetic diversity of species; good characters of whole series of forms may then be gradually combined in one. The origin of germinal diversity is not well understood. The idea of gradual change under the effect of environmental conditions conflicts with present conceptions of the nature of the gene and of changes in it. Fortuitous mutation with subsequent selection of favorable mutations may account for progress, but even so-called mutations may often be cases of complex segregations. Reversion to wild type on crossing is an instance of complex factor interaction, of great theoretical interest because it permits of phylogenetic deductions. Advance in knowledge continually widens the circle of phenomena subjected to genetic experimentation.—*R. E. Clausen.*

1379. VINCENT, C. C. *Results of pollination studies at Idaho University.* *Better Fruit* 14<sup>3</sup>: 11-15. 3 fig. 1920.—One of the first problems in apple orchard pollination is the detection of varieties inclined to be unfruitful when planted alone. Self-sterility is not a constant character; hence fertility of commercial varieties must be tested locally. Of 50 varieties tested, 18 were found to be self-sterile, 7 self-fertile, and 25 partially self-fertile. In this fruit among varieties of apples, when blossoms are exposed to insect visitation, counts were made on certain branches at flowering time and final counts on June 15 of "fruits set." The percentages for the 4 varieties Wagener, Grimes, Rome, and Jonathan ranged from 46.7 to 76 with an average of 63.6; no counts were made at time of harvest. Had harvest counts been made the author estimates a 50 per cent reduction in percentages, bringing the normal set of fruit to approximately 31.8 per cent. If, under favorable conditions, 31.8 per cent constitutes a normal set of fruit when 2 or more varieties are planted together, the majority of varieties tested for self-fertility would not be productive if planted each by itself in large blocks. Two methods of determining self-sterility were tested: 1st, enclosing unopened blossoms in paper sacks, and 2nd, erecting tents of cheese-cloth over individual trees. The results showed very little difference between the 2 methods. Thermometer readings, within and without the cheese-cloth cages, showed that temperature differences under the 2 conditions were very slight. Seed production is less in self-fertilized fruits than in cross-pollinated fruits. A large number of domestic commercial varieties of apples are self-sterile, and those

that are apparently fertile, or partially so, produce fruits inferior in size to those set under natural conditions. Cross-pollination experiments are necessary to determine the best pollinizers for any commercial variety. A test of 9 varieties in 16 crosses shows a wide variation in results; the percentage ranging from 0 for Grimes  $\times$  Gravenstein and Wagener  $\times$  Gravenstein, to 35 for Spitzenburg  $\times$  Grimes, and 34.5 for Newtown  $\times$  Jonathan.—In selecting a pollinizer the following points require consideration: 1st, mutual affinity is necessary between varieties planted together; 2nd, the 2 varieties must bloom at approximately the same time; and, 3rd, the varieties should be good pollen-producers.—For existing orchards, grafting over (at least 1 tree in 10) of a variety deficient in pollen production with a variety producing abundant pollen, is suggested. One hive of bees to the acre, especially during the blooming period, would unquestionably increase the normal set of fruit. [See also Bot. Absts. 6, Entry 1164.]-C. S. Crandall.

1380. WATSON, J. A. S. A Mendelian experiment with Aberdeen-Angus and West Highland cattle. *Jour. Genetics* 11: 59-67. Pl. 12. 1921.—Coat, conformation, horns, and color were included in the investigation. No definite information was obtained concerning coat and conformation. Polled and horned characters form a simple Mendelian pair. In the female, the polled condition is completely dominant while in heterozygous males the development of horns is sometimes but not always completely suppressed.—Black and red are allelomorphic, black being dominant. The relation of dun to black and red is not clear. Different hypotheses are discussed.—E. Roberts.

1381. WHIPPLE, O. B. Methods in pure-line selection work with potatoes. *Proc. Amer. Soc. Hort. Sci.* 14: 34-38. 1917 [1918].—A general discussion is presented.—J. P. Shelton.

1382. WRIEDT, CHR. Albinisme i hester. Borket, hvitborket og gule. [Albinism in horses. Three types of dun involving the albino factor.] *Tidsskr. Norske Landbr.* 1918: 396-406. 1918.—Albino horses are not mentioned in the earlier publications on the inheritance of coat color in horses. In the 2 Norwegian breeds of horses, the Gudbrandsdilians and the Fjords, albino individuals sometimes occur. In the present publication it is demonstrated that several types of dun are the heterozygotes of the albino factor. Three such types of dun are recorded. In the 1st case the albino factor reduces the brown or bay color to a type of dun called "borket." In this type of dun the same black markings as those of brown and bay are found. The not-black color is a golden yellow, especially in the summer. The second type, in Norway termed "gul" (yellow), is the heterozygote of albino and chestnut. These individuals lack the black markings, but the skin is pigmented and the hairs are of the same golden yellow color as in the 1st type. In the 3rd type, termed "hvitborket," the albino factor is in combination with a dominant dilution factor which reduces brown and bay to a type of dun called "blak." "Blak" is the same type of color as the one found in the Prevalseky horse. "Hvitborket" hairs have the same black points as bay, but the rest of the hair has a very faded yellow, nearly white, color.—The data presented show a clear-cut segregation of albinos in both the "borket" and the "hvitborket" crosses. "Borket"  $\times$  "borket" gave 2 brown or bay, 7 "borket," and 2 albinos. Different authors are cited, their data all showing the same kind of segregation. "Hvitborket"  $\times$  "hvitborket" gave 6 "blak," 2 brown or bay, 18 "hvitborket," and 16 albinos. Brown or bay  $\times$  albino gave 10 "borket." "Blak"  $\times$  albino gave 8 "hvitborket." The back-cross "borket"  $\times$  brown or bay gave 119 "borket," 7 "gul" (yellow), 143 brown or bay, and 7 chestnut. The back-cross "hvitborket"  $\times$  "blak" gave 25 "hvitborket," 29 "blak," 1 "røblak" (chestnut reduced by the dilution factor), and 1 brown or bay. The data concerning "gul" are scarce. A single cross of albino  $\times$  chestnut gave "gul." "Borket"  $\times$  chestnut gave 7 "borket," 4 "gul," and 1 chestnut. "Gul" (yellow)  $\times$  brown or bay gave 6 "borket," 2 "gul," 9 brown or bay, and 1 chestnut. The mating albino  $\times$  albino has in Beberbeck given albinos without exception in 200 cases.—The albino color in horses behaves nearly in the same way as does albino in guinea-pigs. Individuals are found which have some pigment on ears, mane, and tail.—Otto L. Mohr.

1383. W[RIGHT], S[EWALL]. [Rev. of: CASTLE, W. E. *Genetics and eugenics*. 2nd ed., 15.5  $\times$  23.5 cm., 395 p., 7 pl., 155 fig. Harvard Univ. Press: Cambridge, Massachusetts, 1920 (see Bot. Absts. 7, Entry 1734).] *Jour. Heredity* 12: 71. 1921.



1384. WRIGHT, SEWALL. [Rev. of: CHILD, CHARLES MANNING. *The origin and development of the nervous system.* 296 p., 70 fig. Univ. of Chicago Press: Chicago, 1921.] *Jour. Heredity* 12: 72-75. 1921.—The author points out that Child's book has wider interest than might be inferred from the title, as it deals with some of the most fundamental problems of biology. He criticises the author for making no attempt to bring the facts of genetics into relation to his theory, and for apparently looking on the cell "as an organization in a particular kind of matter determined merely by a surface-interior gradient in relation to external conditions," overlooking the well-established facts of cytology and the genetical evidence for the individuality of the unit factors. The reviewer sees no incompatibility between "the genetical and cytological conception of the cell as an association of independent organisms, living in a relatively large, less specialized mass of protoplasm and controlling the behavior of the whole in response, of course, to external stimuli, . . . [and] a simple mechanism of heredity and a simple physiological conception of development such as that offered by Child."—*Geo. H. Shull.*

1385. YAMAGUCHI, Y. Kurtze Mitteilung über die Beziehung der Aufblühzeit und des Sitzes der Blüte am Rispenaste zum Korngewichte des Reises. [Concerning the time of blossoming and the flower position on the branch to the grain-weight of rice.] *Bot. Mag. Tôkyô* 34: 136-139. 1 fig. 1920.—The paper is preliminary to a fuller one to be published in Vol. 1, Heft 4, 1919, of *Berichte des Ohara Instituts für Landwirtschaftliche Forschungen* [see following entry].—*Leonas L. Burlingame.*

1386. YAMAGUCHI, Y. Über die Beziehung der Aufblühzeit und des Sitzes der Blüte am Rispenaste zum Korngewichte des Reises. [The relation between the time of flowering and the position on the panicle to the weight of the rice seed.] *Ber. Ohara Inst. Landw. Forsch.* 1: 451-517. 25 fig. 1919.—The flowers on the apical branch of the rice panicle are the first to open. The flowers on a single branch open in a definite but not serial order. The order in which they open on the individual branches was 1, (7), 6, 5, 4, 8, 3, 11, 2, 15, . . . . . The branches of the panicle blossom in characteristic basipetal order. This characteristic regularity may be assumed to have a significant relationship to other characters, such as the weight of the seed.—The heaviest seed (both in the entire panicle and in the separate branch) usually develops from flowers opening on the 2nd, 3rd, or later day. The coefficient of correlation between time of flowering and weight of seed ranges from  $-.660$  to  $-.192$  in 3 varieties studied. A somewhat greater negative correlation was found between weight of glume and time of flowering. Intercomparisons of branches on a panicle showed that the heaviest seeds developed from flowers which opened simultaneously but nevertheless came from flowers which were the first to open on their respective branches.—The heaviest seed is usually the 3rd, 4th, 5th, or 6th from the apex of the panicle branch. On the contrary, the heaviest glume is found on the 1st, 5th, or 6th seed from the branch apex. The average seed weight for the different positions decreases with the progress of the time of blossoming. It may be assumed that there is some definite relationship between the weight of a seed and its position on the branch. The heaviest, lightest, and intermediate seeds generally harmonize closely with the time their respective flowers opened.—The coefficients of the correlation between position and weight of unhulled seeds range from  $-.397$  to  $-.659$ . Since these correlations are somewhat greater than those between the actual blooming time and the seed weight, it is necessary to consider that the ordinal position of the flower on the branch may exert an equal, or greater, influence upon seed weight than the actual blooming period. The investigation shows that the weight of the chaff and the course of blossoming are very closely correlated. In contrast, the correlation is less between the blossoming time and the seed weight. This may be due to something which hinders the development of the apical seed of each branch of the panicle. Factors which determine the seed weight are not easy to define, at least in the rice plant.—*H. S. Reed.*

1387. YEARSLEY, MACLEOD. Can acquired deafness lead to congenital deafness? *Jour. Laryngol. Rhinol. and Otol.* 35: 270-271. 1920.—An account is presented with chart of "an instance in which a family with a history of acquired deafness produced offspring that were

born deaf. It is important to note that the deafness was probably otosclerosis and, therefore, of hereditary character."—*Howard J. Banker*.

1388. ZIMMERMANN, WALTER. [German rev. of: GOLDSCHMIDT, RICHARD. *Mechanismus und Physiologie der Geschlechtsbestimmung*. [The mechanism and physiology of sex determination.] 251 p., 113 fig. Gebrüder Borntraeger: Berlin, 1920.] *Zeitschr. Bot.* 13: 407-410. 1921.

## HORTICULTURE

J. H. GOURLEY, *Editor*

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(See also in this issue Entries 1147, 1198, 1209, 1291, 1293, 1294, 1314, 1315, 1316, 1322, 1332, 1338, 1361, 1364, 1379, 1543, 1546, 1550, 1585, 1595, 1677, 1682)

### FRUITS AND GENERAL HORTICULTURE

1389. ANONYMOUS. A successful (cacao and coconut) plantation in Trinidad. *Agric. News [Barbados]* 19: 249. 1920.—An article in the Port-of-Spain Gazette, July 29, 1920, giving an account of a visit to cacao and coconut estates belonging to Mr. G. G. Brown is abstracted. Of interest is the fact that a system of drastic root pruning, carried out during forking operations, was of great benefit to the cacao fields.—*J. S. Dash*.

1390. ANONYMOUS. The green lime trade of Dominica. *Agric. News [Barbados]* 19: 265. 1920.—A new line of trade is being opened up with Mobile, Alabama, 3576 barrels and 747 boxes of fresh limes having been already shipped. It appears this market favors boxes to barrels, which are in vogue for the New York market, and material has been received for making 20,000 standard boxes of 2 cubic feet each.—*J. S. Dash*.

1391. ALDERMAN, W. H. The horticultural importance of plant associations. *Proc. Amer. Soc. Hort. Sci.* 17: 261-266. 1920 [1921].—A review is presented of the recent work on the influence of one crop on another. The suggestion is made that further work should be conducted with orchard plants to determine the relations of toxicity and plant food requirements.—*E. C. Auchter*.

1392. BABCOCK, E. B. Bud selection and the frequency of mutations. *Proc. Amer. Soc. Hort. Sci.* 17: 40-44. 1920 [1921].—The problem of bud selection as a means of increasing yields in deciduous fruits is discussed. Although some nurserymen are attempting to select their propagating buds from high-yielding parent trees, it is pointed out that the resulting trees can then be offered only as first-class stock of the variety, but nothing more until it has been proved by performance tests of the budded progeny that the character of high yield is actually transmitted. [See also *Bot. Absts.* 9, Entry 1294.]—*E. C. Auchter*.

1393. BEACH, F. H. Pruning schools in Ohio. *Proc. Amer. Soc. Hort. Sci.* 17: 70-73. 1920 [1921].—Pruning schools are rapidly taking the place of pruning demonstrations in Ohio. In 1919, 2 schools, with an attendance of 35, were held in Lawrence County. In 1920, 28 schools, with an attendance of 532, were held in 8 counties. Marked results have been secured.—*E. C. Auchter*.

1394. BELLEFORD, M. V. Note sur la culture du cacao à l'Ile de San Thomé. [Notes on cacao culture in the Island of San Thomé.] *Bull. Agric. Congo Belge* 11: 67-73. 1920.—Notes on the geography, soil and climatic conditions of the island of San Thomé are followed by a brief discussion of cacao culture. Three parasites of the cacao tree are mentioned, *Phytophthora faberi*, *Heliothrips rubrocineta*, and *Lasiodiplodia cacaovicola*, and methods of control suggested. Statistics are given regarding exportation from the island for the years 1902-1916. Two of the chief plantations, "Porto Allegre" in southern San Thomé and "Rio do Ouro" in the north, are described in some detail.—*Henri Micheels*.



1395. BIOLETTI, FREDERIC T. Permanent demonstration vineyards in California. Proc. Amer. Soc. Hort. Sci. 17: 73-79. 1920 [1921].—The author presents an outline of the methods used to carry practical information to the growers. Details of the working arrangement with the owners of vineyards are noted.—*H. W. Richey*.

1396. BLAIR, W. S. Fruit growing in Nova Scotia. Proc. Amer. Pomol. Soc. 35: 157-161. 1917 [1919].—The principal fruit districts are confined to the counties of Kings, Annapolis, and Hants, where a total of over 30,000 acres of apples are planted. Most of the crop produced is exported each year. There are 130 apple warehouses throughout the fruit section, 40 of these are owned by companies which have affiliated, forming the United Fruit Companies of Nova Scotia Limited. This company purchases most of the spray materials, fertilizers, seeds, etc., for the different members. Spraying is carefully done. Bearing orchards are valued at \$500 per acre. The cost of producing apples before 1917 was estimated at \$1.75 per barrel. Most of the crop is packed in barrels, and inspectors enforce a good standard. Varieties most commonly grown are Gravenstein, Ribston, Blenheim, Tompkins King, Northern Spy, Stark, and Ben Davis.—*E. C. Auchter*.

1397. BRIERLEY, W. G., AND W. H. KENETY. Blueberry culture in Minnesota—a report of progress. Proc. Amer. Soc. Hort. Sci. 17: 243-249. 1920 [1921].—This paper reports work done chiefly with selected plants of the "lowbush" blueberry, *Vaccinium pennsylvanicum*. Since the swamp lowbush blueberry, *V. canadense*, blooms and ripens its fruit a little later, this species has been used for the past 2 seasons. *V. corymbosum* has not been able to withstand the severe winters, but more seedlings and hybrids have recently been obtained from Dr. F. V. Coville for further trial. It was found that 1-year old rooted shoots furnished the best propagation material. A table is included showing the effect of different cultural treatments upon the stand and vigor of plants. After 3 years trial only 3 treatments, cultivating, shading, and the 2-inch peat mulching, were retained. Manure proved to be detrimental, probably due to its alkaline nature. As regards effect on vigor and yield it appears that cultivating and peat mulching are about equally satisfactory. The number of berries in the clusters on the cultivated plots was greater than on other plots, and considerably greater than on plants grown in the wild state. The benefits derived from cultivation appear to be greater than those from efforts to renovate wild plantings.—*H. W. Richey*.

1398. CHANDLER, W. H. Some responses of bush fruits to fertilizers. Proc. Amer. Soc. Hort. Sci. 17: 201-204. 1920 [1921].—About  $\frac{1}{8}$  acre each of American gooseberries, currants, American red raspberries, black raspberries, and blackberries was planted in 1914. At the beginning applications were made at the rate of 100 pounds of potassium chloride, 400 of acid phosphate, and 200 of sodium nitrate per acre. As the plants grew the applications were gradually increased until in 1920 the plots received treatments equivalent to 300 pounds of potassium chloride, 600 of acid phosphate, and 350 of sodium nitrate per acre. Where manure, tankage, or dried blood was used, amounts were applied furnishing approximately the amount of nitrogen applied to a plot receiving sodium nitrate.—In comparison with corn, planted in a portion of the gooseberry and currant plots where the berry plants were removed, the evidence seemed conclusive that gooseberries showed no response to phosphorus. Since the soil was so poorly adapted to blackberries and red and black raspberries, it was not possible to determine whether or not any of them would respond to phosphorus though certainly none responded strikingly.—In plots of black raspberries and red raspberries receiving nitrogen, the total cane growth was respectively 1.004 and 1.87 times that of plots receiving no nitrogen; the blackberries showed no measurable response. The application of nitrogen benefited the red raspberry much less in yield than in growth, possibly because the variety used (Cuthbert) suckers very readily.—The currants made no measurable response to any element. Gooseberries responded to nitrogen and possibly to potassium, the response to manure being greater than to complete mineral fertilizers. In the case of the Cuthbert raspberry, the response to sodium nitrate seemed to be greater than to an equal amount of nitrogen in manure, tankage, or dried blood.—*H. W. Richey*.

1399. CHURCH, F. A. **Safeguarding the ripe olive.** Pharm. Era 53: 293-294. 2 fig. 1920.—An account is given of the laws regulating the packing of ripe olives in California, following several fatal cases of poisoning.—*C. M. Sterling.*

1400. CLARK, T. W. **Methods of testing cacao beans.** Agric. News [Barbados] 19: 254-255. 1920.—The article discusses the methods of testing and the demands of buyers, indicating how a bean best suited to the latter is produced. In this connection information is given enabling the planter to make tests for himself and thus secure an indication of the value of his product.—*J. S. Dash.*

1401. COLBY, A. S. **Pruning notes on blackberry varieties.** Proc. Amer. Soc. Hort. Sci. 17: 241-242. 1920 [1921].—A brief discussion is given of the general pruning of blackberries in Illinois. Tests were made with 11 varieties in duplicate rows, the laterals in 1 row being headed back severely whereas those in the other were not headed back. The author grouped the varieties as follows: "First, those which carry their cluster-buds well in towards the base of the laterals and well down on the canes; second, those which carry their buds out nearer the tips of the laterals and canes; and, third, those whose buds are scattered fairly well along the production wood." Ward and Lawton, with laterals having from 8 to 14 buds with the outer 5 without fruiting clusters, belong to the 1st class; cutting back the laterals  $\frac{1}{2}$  results in little reduction in the yield. Early King, Taylor, and Wachusett, with an average of 15 buds to the lateral, belong to the 2nd group. Since the first 3 to 5 buds are not fruitful, pruning off more than  $\frac{1}{3}$  decreases the yield. Snyder, Ancient Briton, Wilson, Ohmer, Eldorado, and Mersereau, the most vigorous and productive domestic varieties, belong to the 3rd group, in which the cluster buds are fairly evenly distributed along the producing wood. Severity of pruning is more necessary in this group, and, as many of the laterals carry as high as 18 buds, they may be cut back  $\frac{1}{2}$ .—*H. W. Richey.*

1402. COLBY, G. E. **California fruits.** Monthly Bull. Dept. Agric. California 10: 35-39. 1921.

1403. CONDIT, I. J. **Getting the people acquainted with the great American fig.** Associated Grower 1<sup>6</sup>: 11-12. 1920.—The Calimyrna (the Smyrna of California) has a golden yellow color, thin skin, amber pulp, and a rich flavor. It is an excellent fresh fruit product. Caprification is emphasized as an essential detail in the culture of this fig.—*E. L. Overholser.*

1404. COOPER, J. R. **Preliminary report on the effect of fertilizers in apple orchards in the Ozark region.** Proc. Amer. Soc. Hort. Sci. 17: 190-193. 1920 [1921].—A series of plot fertilizer experiments in bearing apple orchards, with 5 complete series of elements used alone and in combinations, 3 series in young orchards not yet in bearing, 2 in bearing peach orchards, and some in vineyards and strawberry fields are being carried on. Nitrogen has given the greatest promise of direct results. In orchards growing on poor, leachy soils the set of fruit was increased from  $1\frac{1}{2}$  to 10 per cent, with 40 per cent of the spurs blooming, and from 1 to  $5\frac{1}{2}$  per cent, with 81 per cent of the spurs blooming; a larger percentage of the fruit which set was carried to maturity. In fertile heavy soils, or soils which had previously been manured little or no benefit was noticeable in the set. In 1 orchard which had been nitrated in the previous season, as well as manured, the application of more nitrate the following year seemed to decrease the set over that in the unfertilized plot. No effect on the set of fruit was observed from the use of either phosphorus or potash.—Judicious pruning stimulated the effect of nitrogen for a single season. Continued pruning was inadvisable as a method of procuring a successful set of fruit. The author states "Our observations have led us to believe that the whole tree performs as more or less of a unit and that the difference in performance of different parts is due largely to location with regard to food and water supply and other conditions of environment. Our record of spur growth follows very closely the description given by ROBERTS. It seems to us, however, that there is more mass than individual action and that the performance of different classes of spurs is due largely to location and finally to the available supply of plant food."—The author finds that it is possible to change the performance



of spurs by pruning and by controlling the nitrogen and water supplies. Using the percentage and rapidity of germination of pollen as a standard, the vitality of pollen was found to increase either following a special pruning or the early use of quickly available nitrogen. Less frost injury was found in the sod portion of 1 orchard than in the cultivated part. A distinct relation was found between size of apple and number of contained well-developed seeds. There was a tendency to poorer color of fruit on all nitrogen plots. The fruit also matured somewhat later and was considerably larger in size.—*E. C. Auchter.*

1405. COX, U. T. **The Rome Beauty apple in Ohio.** *Proc. Amer. Pomol. Soc.* 35: 187-189. 1917 [1919].—The origin and early history of the Rome Beauty apple is recorded. The first spraying tests in Ohio were made in the author's orchard in 1890. Nitrate of soda for the trees and acid phosphate for the sod have proved beneficial; potash has not been beneficial. Several bud sports of the Rome Beauty have originated on the author's farm.—*E. C. Auchter.*

1406. CRANFIELD, FREDERIC. **Cherry culture in Wisconsin.** *Proc. Amer. Pomol. Soc.* 35: 122-125. 1917 [1919].—Cherries have been growing in Wisconsin for at least 300 years. The first commercial cherry orchard was planted in Door County in 1893. There are now approximately 5000 acres in this county alone. The sour cherry is grown almost exclusively. The methods of cultivation, pruning, spraying, harvesting, packing, and marketing as used in Wisconsin are described.—*E. C. Auchter.*

1407. CULLINAN, F. P. **Transpiration studies with the apple.** *Proc. Amer. Soc. Hort. Sci.* 17: 232-240. 1920 [1921].—In 1918 studies were made on 2 2-year old trees, one severely pruned, the other unpruned. The transpiration data obtained indicated that the pruned tree transpired relatively more water per unit area of leaf surface than the unpruned. Both trees made exactly the same gain in growth during that season, yet the unpruned trees had about 56 per cent greater leaf area than the pruned. Because of the greater leaf area it is probable that the unpruned tree would actually transpire more water than the pruned tree, yet the rate of transpiration per unit area of leaf surface was greater in the latter.—Other studies were made with mature apple trees, and also with pepper plants [*Capsicum*] grown in the greenhouse. The latter were grown under varying conditions of moisture, nitrogen, and pruning. "The data in all cases show the very marked effect of the removal of small portions of the stem and foliage in the reduction of the total leaf surface and the amount of dry matter produced." It is concluded that "the mere passage of water through the plant has no influence on assimilation activity, provided the water supply does not fall below a certain minimum required to maintain the turgor of the cells."—*E. C. Auchter.*

1408. CUNLIFFE, R. S. **Propagation of some tropical fruits: cultivation of the pawpaw.** *Agric. News [Barbados]* 19: 246-247, 262-263. 1920.—*Carica papaya* presents many and varied forms. The trees may vary from 8 feet high and 4 inches in diameter to 20 feet high and 2 feet in diameter. The fruits may be oval, roundish, pear-shaped, or oblong, weighing from a few ounces to 25 pounds. When immature, the fruits are green; when ripe, of any shade between green and purple, with much meat or little, many seeds or none. Sexually, the differences are even greater, and on this basis some 12 or 13 forms have been recognized, some of which may change over, under certain conditions, to the opposite sex. Some trees have purely staminate flowers, others purely pistillate. Some bear hermaphrodite flowers, some both staminate and pistillate flowers. Successful cultivation depends on reducing unproductive male trees to a minimum, increasing the producing capacity of bearing trees, and improving the fruits. Usually cultivated from seed, the first of the above objects is attained by a rigid and continual selection of seed. This is continued because types are apt to break up, especially owing to sudden changes of environment. Another method of propagation which has given some success is the grafting of scions of selected stock on young seedlings in very early stages of development. The plants bear in about 12 months from seed.—*J. S. Dash.*

1409. DANIEL, LUCIEN. **À propos des greffes de soleil sur Topinambour.** [Concerning the grafts of Topinambour sunflowers.] *Compt. Rend. Acad. Sci. Paris* 172: 610-612. 1921.—

A study of the tubercles formed on the stock of grafts of *Helianthus orgyalis* is presented. The number, volume, and weight of these tubercles were ascertained and the inulin content studied. Similar studies were made of the scions of Topinambour grafts on these stocks, and it is concluded that the sunflower is not the only source of the inulin present in these scions.—*C. H. Farr.*

1410. DORSEY, M. J., AND J. W. BUSHNELL. The hardiness problem. *Proc. Amer. Soc. Hort. Sci.* 17: 210-222. 1920 [1921].—The authors give a brief résumé of the years, localities, extent, and types of winter injury to various kinds of dormant fruit trees, together with short discussion of horticultural practices which have developed to mitigate winter injury. In summarizing the experimental work on the rest period of plants the authors state "Evidence seems to indicate that a plant is more susceptible to winter injury after the rest period is broken, although there are indications that there is a killing temperature for all species of woody plants even while in deep dormancy. This temperature is seldom if ever reached for some. The investigations of the rest period to date show an intimate relationship between dormancy and hardiness and also furnish an accurate guide to cultural methods." Various experiments are cited in which the hardiness was tested of the seedlings and cuttings of the same species but collected from the southern central and northern range of the species. It was found that, as a rule, the progeny were progressively less hardy the more southerly their origin. Whitten, working with peaches, has shown that there is no permanent adjustment in the length of the growing season of a variety as there is in a species. The authors conclude "it may be safely assumed, since the species is heterozygous, that the plants of the species in the north are genetically different from those farther south in that only those possessing the factors for hardiness have survived." In discussing the physiological phase of hardiness it appears to the authors that the plant as a whole does not react as a unit but some tissues of the tree are more subject to injury than others. A brief discussion is given of the theories of hardiness advanced by recent investigators.—*H. W. Richey.*

1411. DUNLOP, W. R. A Guatemalan coffee estate. *Agric. News [Barbados]* 20: 114, 115. 1921.—This article discusses in a general way the conditions, methods employed, etc., on a coffee estate of 2000 acres situated between the altitudes of 2000 and 5000 feet. High grade coffee is produced, and the author thinks this is due to the special conditions of altitude, climate, etc., prevailing.—*J. S. Dash.*

1412. FARMER, L. J. Are fall- or ever-blooming strawberries a success? *Proc. Amer. Pomol. Soc.* 35: 132-137. *Pl. 32, fig. 3.* 1917 [1919].—A description of different fall- and ever-bearing strawberry varieties is given. The origin and history of fall-bearing strawberries is included, and the author believes that they are now past the experimental stage, being a decided success under local conditions in New York.—*E. C. Auchter.*

1413. GOURLEY, J. H. The commercial production of the blueberry. *Proc. Amer. Pomol. Soc.* 35: 133-144. 1917 [1919].—The geographical distribution of the crop is shown. The New England states, with Maine leading, produce most of the crop in this country. In 1914, 151,636 cases of blueberries were packed in the United States. A good yield is 2000 quarts per acre. Picking privileges and methods of picking are discussed. The lowbush pastures are generally burned over once in 3 years. The best berries are produced on the new vigorous shoots.—*E. C. Auchter.*

1414. GOURLEY, J. H. The effect of shading some horticultural plants. *Proc. Amer. Soc. Hort. Sci.* 17: 256-260. 1920 [1921].—This paper reports the observations of the effects of shading apple, peach, and plum trees, and various kinds of flowers and vegetables in New Hampshire. During the hottest weather the temperature was always highest in the shade, while in cool weather the temperature in the shade was slightly higher during the day and lower at night than the temperature in the open. The shaded leaves were much larger and much thinner than the unshaded and wilted more rapidly. A difference in structure was also noted. In the trees the growth in the shade was greater in length, more slender, and less



branched. The same was true of the smaller plants, in which, furthermore, the root systems were greatly restricted. It was noted that comparatively few blossoms formed in the shade, but that the plants in the open bloomed normally.—*H. W. Richey.*

1415. GRAY, G. P., AND H. J. RYAN. Reduced acidity in oranges caused by certain sprays. *Monthly Bull. Dept. Agric. California* 10: 11-33. 1921.—The acidity of both Navel and Valencia oranges is greatly reduced when a spray composed of soap, sodium carbonate, sulphur and lead arsenate is applied to the trees, even for 1 season. This reduction in acidity amounts to more than 50 per cent in some cases. The physiological phenomenon involved is not known. The arsenic compound, which seems to be chiefly responsible for the effect, is probably slowly converted, first into a soluble form. The facts do not correlate the reduction of acidity with local absorption of the spray by the fruit, the action of the spray probably being systemic, affecting the whole tree.—*E. L. Overholser.*

1416. GREENE, L. Orchard soil management studies in Indiana. *Proc. Amer. Soc. Hort. Sci.* 17: 185-190. 1920 [1921].—The author believes that soil moisture is one of the limiting factors in orchard production. He suggests that even though nitrates are added to sod orchards, conservation of soil moisture is still necessary. The differences appearing between plots A and B are attributed to soil moisture conditions rather than to plant food conditions alone. The experiments show that growth and production are very closely coordinated. The author states "Under the conditions of the experiments at Laurel, 2 types of orchard soil management have supplied moisture in sufficient quantities to produce sufficient growth to show profitable production. These 2 are clean cultivation with cover crop, and straw mulch applied at the rate of from seventy-five pounds per tree in the early history of the orchard to one hundred and fifty pounds per tree during the later years." Where cultivation can be practiced without erosion, the writer believes it will undoubtedly prove to be, in most cases, the most economical method of soil management. "Under certain conditions of cheap mulching material the straw mulch will undoubtedly prove more economical than will cultivation. It is altogether probable that a sufficient amount of mulching material can be grown between the trees if the entire orchard is fertilized for grass production as shown by Professor Ballou in southern Ohio."—"One of the dangers which confronts the practical orchardist who adopts the sod mulch method, is that it is very easy to neglect the supply of mulch material necessary to properly conserve moisture, and the trees will suffer accordingly. In other words, sod mulch is the system of the careless orchardist, and while when rightly used it will probably produce as good fruit with better color at very near the same net profit per acre, it is a system which needs careful attention to be made successful."—*E. C. Auchter.*

1417. HARDY, F. The application of fertilizers in orchard cultivation. *Agric. News [Barbados]* 20: 74. 1921.—This paper considers a communication from Mr Keys, Asst. Curator of the Dominica Botanic Station, entitled *The Necessity for Clear Statements in Regard to the Rate of Applying Artificial Fertilizers in Orchard Fertilization*, in which the author makes a plea for the units of weight mentioned in reports of such experiments to be expressed per tree and not per acre, since very often the number of trees per acre is not stated.—*J. S. Dash.*

1418. HEDRICK, U. P. Report of the National Research Council Committee. *Proc. Amer. Soc. Hort. Sci.* 17: 276-279. 1920 [1921].—The committee felt that the American Society for Horticultural Science, through the cooperation of the National Research Council, could well take up the question of establishing arboreal plantings of species of cultivated fruits and nuts in the different parts of the U. S. A. It is planned as a preliminary step to make a survey of living arboreal plant material available for breeding purposes at arboreta and other places in the U. S. A. and Canada. Dr. GALLOWAY was asked to make this survey. The findings will be published either as a government bulletin or as a bulletin from the National Research Council. After this report is secured, future plans for organizing and developing the different arboreal plantings can be made.—*E. C. Auchter.*

1419. HEINICKE, A. J. The seed content and the position of the fruit as factors influencing stippen in apples. Proc. Amer. Soc. Hort. Sci. 17: 225-232. 1920 [1921].—The author finds: (1) That the early form of stippen, or bitter-pit, occurs more often on lateral fruits of a cluster than on central ones; (2) that the disease is more prevalent on fruit of spurs near the basal portions of the branches; (3) that fruits on branches making a vigorous growth are attacked less; (4) that fruits with few seeds are more susceptible than those with many seeds; and (5) that stippen seems to be associated with earlier maturity. The stippen appearing after the fruit is harvested is more prevalent on many-seeded fruits. The author also noted that the conditions which seemed to retard the development of the early form of stippen often were associated with the presence of water core. It is concluded that "the bitter pit which appears in the mature fruit that is still attached to the tree seems to be associated with conditions favorable for incipient wilting, but unfavorable for an abundant, or even an adequate, supply of nutrients. On the other hand, the form of stippen which does not become manifest until the fruit is harvested, or generally several weeks later, seems to be associated with conditions that favor an abundant or even an excessive supply of water and the other size-producing nutrients." The author believes, however, that the so-called true bitter-pit is probably due to the same causes which bring about the earlier appearing stippen.—H. W. Richey.

1420. HIGGINS, J. EDGAR. Report of the Horticultural Division. Hawaii Agric. Exp. Sta. Rept. 1919: 16-40. Pl. 1-5. 1920.—Report of investigations conducted with Macadamia nuts, avocados, mangoes, papaya (*Sola* variety), litchi, coffee, vanilla, pineapples, and algaroba.—J. M. Westgate.

1421. HOWARD, W. L. Use of dust sprays in California. Proc. Amer. Soc. Hort. Sci. 17: 106-108. 1920 [1921].—Dry sulphur has always been the standard remedy for mildew on grapes. In no other instance has a dry spray proved to be of practical importance in California as a fungicide, and wet sprays are used almost exclusively for controlling diseases.—Sulphur dust has been found very effective against red spider on almond, peach, and plum trees. It is believed that the heat of the sun slowly volatilizes the sulphur and that these slowly liberated fumes kill the mites. Lately a new dust spray, known as Nicodust, composed of nicotine sulphate in 2, 5, and 10 per cent combinations with kaolin clay as a carrier, has been giving success with certain insects. It was first used against leaf aphid on walnut, a 2 per cent dust proving successful. A 5 per cent Nicodust successfully controlled thrips on prunes, pears, and nursery stock. This dust has not proved effective against red spider, possibly because the liberation of the nicotine fumes is completed in about 3 hours, whereas sulphur fumes are liberated more gradually, continuing for days. Because Nicodust kills by the rapid liberation of nicotine fumes it is necessary, under California conditions, that the dust be applied to the trees during the warm part of the day.—Arsenate of lead as a dust has never been used, except in a very limited way, against such insects as the codling moth; where employed it was not a success. The future development of dry sprays as insecticides seems to lie in the direction of those that give off fumes rather than in the use of arsenicals.—H. W. Richey.

1422. JONES, J. Report on the Agricultural Department, Dominica. Rept. Imp. Dept. Agric. West Indies 1919-1920: 44. 1921.—Interesting plants in the gardens, and of which some account is given, are: *Baikiaea insignis*, which during 5 months bore from 50 to 100 delicately scented flowers which opened between 4 and 5 o'clock in the afternoon and faded the next morning; *B. Eminii*, *Amherstia nobilis*, *Pongamia glabra*, *Deguelia microphylla*, and *Chenopodium ambrosioides* L. (Mexican tea).—From certain notes on the nurseries it appears that soils are greatly exhausted by the constant growing of lime seedlings, and a simple method of maintaining fertility has been evolved. The beds are 4½ to 5 feet wide, separated by paths 3 to 3½ in width. After the beds are planted, accumulations of weeds, grass, and leaves are placed in the paths, the latter having considerable half-rotted matter by the time the seedlings are removed. The beds for the next crop of seedlings occupy the positions of the former paths. This practice keeps up the fertility of the beds indefinitely so long as sufficient humus is supplied.—Among the economic plants, *Momordica cochinchinensis* flowered and was hand-



pollinated. The first fruit weighed  $3\frac{3}{4}$  pounds. The seeds of this plant yield an oil of remarkable drying properties; besides, the plant is a very desirable climbing ornamental, quickly covering walls or arbors and producing striking flowers.—It is stated that some of the best flowered mangoes are the poorest shippers. Selection work with mangoes and avocados to supply the Canadian market is urged. Trials with avocados indicate that varieties from the Mexican highlands are not satisfactory for growing on West Indian island coasts. Onion culture is making considerable progress; on one estate some 30,000 pounds were produced last season. It has been proved that onion seed can be produced in Dominica, but for the present planters depend on supplies of Teneriffe seed. Camphor experimentation is still in progress. —Among the principal exports, the lime crop shows an increase of 12,000 barrels over the average annual output for several years prior to 1918. It is pointed out that the Florida lime industry affects but little the green lime trade of Dominica, absorbing, as a matter of fact, only 2 per cent of the Dominica lime crop.—It has hitherto been very difficult to obtain reliable figures as to the cacao production, owing to smuggling to the neighboring French islands. Market conditions having changed, however, the last cacao crop was shipped in the proper way. Thus the figures of export for 1919, 700,387 pounds, valued at \$150,000, more closely represents the actual crop figures. On page 19 is given a complete list of the agricultural exports for the years 1917–18–19.—Discussing the present agricultural situation at length, the author urges greater attention to cultural methods, the increased use of green and artificial manures, the regular employment of labor for the benefit of both the laborer and the plantation, the establishment of land settlement schemes for laborers, etc. On page 20 is given a résumé of the plant legislation now in force in Dominica. On p. 21–30 an account is given of the condition of the lime experiment station, with valuable notes as to methods employed; manurial experiments; the comparison between spineless limes budded on sour orange stocks and grown with *Canavalia* for green dressing, common limes similarly budded and grown with *Tephrosia*, common limes similarly budded and grown without green dressings, and common seedling limes clean-weeded; new lines of experimentation, etc. Cacao manurial experiments are presented in tabular form and fully discussed on p. 37–44. It is observed from these that 20 years of trials show that a complete manure is absolutely essential to successful cacao cultivation, and it now remains to determine the effects of various forms of nitrogen, phosphate and potash.—*J. S. Dash.*

1423. JONES, J. Root pruning of cacao trees for improvement of production. Agric. News [Barbados] 19: 404. 1920.—It has been noted that poor-bearing cacao trees often present a large and very healthy appearance whereas neighboring heavy-bearing trees appear comparatively undeveloped or less healthy. The question having arisen whether the low yield was not often due to unusual vegetative vigor, 1 of 2 low-yielding trees, growing in a plot of trees yielding 100 pods per tree per annum, was carefully root-pruned. The original average yield of these 2 trees was 25–30 pods per annum. After the pruning the treated tree bore a crop of 78 fully grown pods while the unpruned one beside it bore 14. While the result is not conclusive in itself, it points to a new field for extensive trials, since root pruning would be infinitely easier and possibly more successful than cutting back and budding developed trees.—*J. S. Dash.*

1424. KNOWLTON, H. E. Methods in apple pollination experiments. Proc. Amer. Soc. Hort. Sci. 17: 44–47. 1920 [1921].—Attention is drawn to the fact that great care and accuracy should be used in carrying on apple pollination work in the field. A refinement of methods and the elimination of as many sources of error as possible are suggested.—The use of the "bagging" method is questioned as compared with the practice of covering the entire tree with a muslin frame. It is suggested that temperature and light conditions are more abnormal under bags. At least 500 blossoms should be worked in each case, whether cross- or self-pollinations are made. Since weather conditions at blossoming time materially affect the percentage of set, the author states that the results secured on different days or in different years should not be summarized and averaged. As much work as possible should be done in 1 day under the same conditions, and a careful record of the weather conditions should be tabulated and reported as part of the data.—*E. C. Auchter.*

1425. LAFFER, H. E. **Pruning of the vine.** Agric. Gaz. New South Wales 31: 655-661. 1920; 32: 119-126, 339-342. 13 fig. 1921.—The author discusses various methods of pruning, such as the Thomery Spalier system, Bordelais Spalier system, and Cazenave's Cordon system. The method of training the home vine is also discussed.—*L. R. Waldron.*

1426. MANEY, T. J., AND H. H. PLAGGE. **Fruit bud production in the apple.** Proc. Amer. Soc. Hort. Sci. 17: 250-256. 1920 [1921].—The paper records a study of fruit-bud production in an Iowa orchard used since 1910 for a study of various cultural methods. The production of fruit buds on 1-year old wood and on spurs of different ages was observed and groupings made accordingly. A correlation was noted between the amount of new growth,—and the consequent development of spurs,—and fruit-bud formation. The conclusion reached is to the effect that, if twig growth and productiveness are related, the logical means of effecting fruitfulness is by proper pruning methods, soil culture and fertilization, use of hardy stock, proper distance of planting, and spraying.—*E. C. Auchter.*

1427. MANUEL, H. L. **Vineyard notes for May.** Agric. Gaz. New South Wales 32: 348. 1921.

1428. MATTHEWS, C. D. **Report of the Division of Horticulture.** Ann. Rept. North Carolina Agric. Exp. Sta. 43: 46-51. 1920 [1921].—A brief statement is presented of cultural studies with apples, peaches, pecans, strawberries, Irish potatoes, sweet potatoes, and cabbage.—*F. A. Wolf.*

1429. MILLER, E. CYRUS. **Commercial apple growing in Massachusetts.** Proc. Amer. Pomol. Soc. 35: 172-174. 1917 [1919].—Personal experiences in growing apples in Massachusetts since 1888 are given. Prices received for the crop in different years are shown.—*E. C. Auchter.*

1430. MURRILL, W. A. **The papaya, or tree melon.** Sci. Amer. 124: 191, 200. 4 fig. 1921.—The article describes the species *Carica Papaya*.—*Chas. H. Otis.*

1431. NEER, F. E. **Comparisons between sun-drying and stack-drying.** Monthly Bull. Dept. Agric. California 10: 70-72. 1921.—In stack-drying, fruit should first be exposed to the sun for about half a day in order to get the color desired. The sugar content of sun- and stack-dried products is the same, but the eating quality of the stack-dried product is superior.—*E. L. Overholser.*

1432. OVERHOLSER, E. L. **The peach tree after fruit harvest.** Associated Grower 16: 5, 6. 1920.—The author quotes scientific facts to support the statement that certain cultural methods should be observed after the fruit is harvested in order to obtain the maximum amount of stored food, a concentrated sap, and the formation of plump fruit buds.—*F. de Villiers.*

1433. PATTERSON, J. M. **Commercial pecan culture—a new industry.** Proc. Amer. Pomol. Soc. 35: 144-156. 2 pl. 1917 [1919].—The early history and origin of pecans is discussed. The southern states produce practically all of the commercial crop. The future of the pecan industry is depicted as being very bright. As regards food value in terms of calories, 1.1 pounds of pecans are equal to 1.5 pounds of bacon, 2.45 of smoked ham, 4.1 of porterhouse steak, 4.89 of mutton, or 5.35 of chicken. As a food, pecans are therefore reasonable in price when compared with various meats. It is claimed that pecans are not more subject to insect enemies or diseases than common fruits. Cooperative packing and marketing associations are now being formed in the U. S. A.—*E. C. Auchter.*

1434. PICKETT, B. S. **Responses of a young peach orchard to certain cover crops and fertilizer treatments.** Proc. Amer. Soc. Hort. Sci. 17: 193-197. 1920 [1921].—Cover crop and fertilizer experiments were carried on near Olney, Richland County, Illinois. Forty-three major plots, each containing 16 trees, were used. Guard rows between the different plots



were provided for. The orchard was started in 1917 and the experiments begun in the same year. In 1920, a good crop of fruit was produced and yield and growth records were secured. The following observations were made: (1) As compared with clean cultivation, cow peas used as a cover crop, planted July 10-15, were detrimental to the growth and yield of peach trees; (2) the addition of a fertilizer carrying soluble potassium completely corrected the difficulty; (3) the addition of a fertilizer carrying soluble nitrogen partly corrected the difficulty; (4) the addition of a fertilizer carrying phosphorus gave uncertain results; (5) the addition of both nitrogen and potassium somewhat increased the yield of cover-crop plats over clean cultivation plats; (6) rye following cow peas, used as a winter cover, was very detrimental, almost deadly, in effect.—*E. C. Auchter.*

1435. POLE EVANS, I. B., MARY R. H. THOMSON, V. A. PUTTERILL, AND GEO. HOBSON. Further investigations into the cause of wastage in export citrus fruits from South Africa. Union of South Africa Dept. Agric. Bull. Gen. Ser. 1. 48 p., 54 fig. 1921.—The investigations include an examination of the methods of handling the fruit and of the channels through which it passes from the orchard to the market. Orchards, packing sheds, railway trucks, cold stores, and box-wood were examined and inoculation experiments carried out with the various fungi found. It is shown, however, that wastage is due to the olive green mould, *Penicillium digitatum*, and to the blue green mould, *Penicillium italicum*. These moulds are apparently incapable of attacking perfectly sound fruits, hence the danger of wounded fruits is pointed out, also the many sources of bruising. Special attention is drawn to the dangerous practice of packing with an excessive bulge. Experimental consignments of fruit, picked, graded, and packed by specially selected men, were put on the London market with very favorable results. The investigations show that with ordinary care and intelligent handling, South African citrus fruits can be placed on the overseas markets with only a negligible amount of waste. The scope and justification for continuing the investigation are pointed out.—*M. R. H. Thomson.*

1436. POPENOE, WILSON. Tropical fruits. Proc. Amer. Pomol. Soc. 35: 196-214. 1917 [1919].—The common and scientific names of many tropical fruits are listed. Brief discussions concerning the names of several fruits are given.—*E. C. Auchter.*

1437. REES, R. W. Central fruit packing associations as an extension project. Proc. Amer. Soc. Hort. Sci. 17: 80-83. 1920 [1921].—In 1918, at the request of a group of New York fruit growers for aid in marketing fruit, the extension specialist and county agent helped organize a community packing house. The details of the organization were worked out in several meetings with a committee of the growers. In 1918, 6 community packing houses were operated; in 1919, 7 more were added, and in 1920, 12 additional ones were organized. In 1920, 21 of these locals were federated into a central association.—*E. C. Auchter.*

1438. ROBERTS, R. H. Experiments upon apple tree nutrition. Proc. Amer. Soc. Hort. Sci. 17: 197-200. 1920 [1921].—In nutritional studies with apple trees, the author finds fruitfulness apparently closely related to nutritional conditions. His recent data indicate that blossom-bud formation has a definite relation to the nature and amount of reserve materials in the tree. Yield records are not considered as of as much importance as certain other growth and blossom records of spurs, terminals, laterals, etc.; a suggested list of desirable data is included. It is felt that the relation of growth conditions to fruitfulness is a rather constant matter. Although the internal composition of the tree is important, it is felt that such knowledge is not necessary in a practical measurement of the vegetative or fruiting condition of the tree. The author states "There are correlated growth conditions which answer very well for purposes of experimentation if it is constantly remembered that they are not the factors giving fruitfulness, but are, in turn, only the effects of internal conditions."—*E. C. Auchter.*

1439. ROGERS, A. J. Sweet cherry culture. Proc. Amer. Pomol. Soc. 35: 118-121. 1917 [1919].—The author gives his experience in the growing, harvesting, packing, and marketing of cherries.—*E. C. Auchter.*

1440. TAFT, L. R. Commercial cherry culture. *Proc. Amer. Pomol. Soc.* 35: 106-118. 1917 [1919].—Statistics from the 1910 census are used to show the number of trees and size and value of the cherry crop in the 7 leading states. A map of the Michigan fruit belt is given with data on the effect of Lake Michigan on the land temperature. Recommendations are made for the proper soil and site for orchards, age of trees for planting, best varieties, and cultural treatment. The proper methods of harvesting and marketing the crop are discussed, together with the extent of the canning industry in Michigan. It is also suggested that sour cherries could profitably be grown in Massachusetts and other New England states.—*E. C. Auchter.*

1441. TERRY, H. B. Pruning of deciduous trees. *Jour. Dept. Agric. South Africa* 2: 268-274, 358-371, 457-461. *Fig. 7-27.* 1921.

1442. TRIBOLET, J. Mangoes, pawpaws, and avocado pears. *Jour. Dept. Agric. South Africa* 2: 338-339. 1921.

1443. TUFTS, W. P. Factors in pruning the bearing peach. *Associated Grower* 1<sup>10</sup>: 36-37. 1920.

1444. TURNER, A. G. Citrus industry. Report on visit to California. *Rhodesia Agric. Jour.* 18: 142-166. 6 *pl.* 1921.

1445. VANDERVORT, H. S. A demonstration community packing house as an extension activity. *Proc. Amer. Soc. Hort. Sci.* 17: 83-86. 1920 [1921].—A demonstration community packing house was constructed at state expense at Inwood, West Virginia, in 1920. During the first season (1920) 108 cars were shipped from the plant. Growers were taught the great value of proper spraying and packing as a prerequisite for successful marketing.—*E. C. Auchter.*

1446. WARING, J. H. The probable value of trunk circumference as an adjunct to fruit yield in interpreting apple orchard experiments. *Proc. Amer. Soc. Hort. Sci.* 17: 179-185. 1920 [1921].—Correlation studies were made between the inches gained in trunk circumference and the pounds of fruit produced in several Pennsylvania orchards where fertilizer experiments had previously been carried on. In addition, the coefficients of variability for circumference and yield were determined.—“In-as-much as trunk circumference records used in conjunction with records of the production of fruit, have enabled us to reach certain truths that had not been discovered by our study of production records alone, we conclude that trunk circumference records do have a decided value which may closely approach the value of the yield records themselves as an aid to the correct interpretation of results in apple orchard experiments.”—*E. C. Auchter.*

1447. WEBB, WESLEY. Progress of pomology on the Delaware-Chesapeake peninsula. *Proc. Amer. Pomol. Soc.* 35: 182-186. 1917 [1919].—The early history of fruit growing in Delaware is given. Attention is called to the fact that the Peninsula leads the world in strawberry production. The peach fertilization experiments of C. A. McCUE, which demonstrate the value of nitrogen in peach orchards, are reviewed. The apple varieties commonly grown are Stayman Winesap, Yellow Transparent, Early Ripe, Williams Early Red, Jonathan, Grimes, Rome Beauty, and Paragon. Apple grading laws and fruit sizing machines have helped to raise the standards of packing.—*E. C. Auchter.*

1448. WESTER, P. J. Plant propagation and fruit culture in the tropics. *Bur. Agric. Philippine Is. Bull.* 32. 184 *p.*, 23 *pl.* 1920.—The bulletin is a general manual covering the field indicated by the title. While this publication applies primarily to the subjects in the Philippines, much of the data assembled are applicable to other tropical countries, and it should be of great value to all residents in the tropics who are interested in the subject.—*E. D. Merrill.*



1449. WESTER, P. J. The breadfruit. Philippine Agric. Rev. 13: 221-229. Pl. 1-4. 1920.—A plea is made for the more general utilization of this important food plant. Directions are given for propagating the seedless form.—E. D. Merrill.

1450. WESTER, P. J. The coconut palm, its culture and uses. Bur. Agric. Philippine Is. Bull. 35. 73 p., 23 pl., map. 1921.—The bulletin is a general publication with a special view to conditions existing in the Philippines in reference to the culture of the coconut palm.—E. D. Merrill.

1451. WESTER, P. J. The cultivation and uses of roselle. Philippine Agric. Rev. 13: 89-99. Pl. 1-4. 1920.—A plea is made for the more general utilization of this plant, *Hibiscus sabdariffa* Linn.—E. D. Merrill.

1452. WESTER, P. J. The preservation of tropical fruits. Philippine Agric. Rev. 13: 173-185. Pl. 1-4. 1920.—General directions are given for preserving the more common tropical fruits with a view to popularizing their use among Caucasian residents in the tropics.—E. D. Merrill.

### FLORICULTURE AND ORNAMENTAL HORTICULTURE

1453. ANONYMOUS. Native plants at the National Botanic Gardens. No. 6. *Greyia Sutherlandii*. No. 7. *Kniphofia* sp. South African Gard. 11: 81-131. 2 fig. 1921.

1454. BOYNTON, KENNETH R. *Ceratostigma plumbaginoides*. Addisonia 5: 45, 46. Pl. 183 (colored). 1920.—The species is a perennial herb, native of China. It has been in cultivation for the past 50 years and is a desirable border plant.—T. J. Fitzpatrick.

1455. BOYNTON, KENNETH R. *Monarda media*. Addisonia 5: 39. Pl. 180 (colored). 1920.—This mint is a native of northeastern U. S. A. and has been in cultivation nearly 3 centuries in the U. S. A. and Europe.—T. J. Fitzpatrick.

1456. COX, GERAN N. Raising hybrid rhododendrons. Gard. Chron. 69: 126-127. 1921.—The author states that he has seen at least 53 species on the Burmese-Chinese border and that at least 250 new species have been discovered in eastern Asia within the last 10 years. There are an enormous number of existing hybrids, and at least 50 per cent of these are not cultivated at Caerhays. He suggests a central authority like the Rhododendron Society to classify and interpret them for gardeners.—P. L. Ricker.

1457. MORRIS, ROBERT T. Notes on nut bearing coniferous trees. Proc. Amer. Pomol. Soc. 35: 156-158. 2 pl. 1917 [1919].—Descriptions are given of the nuts and other bi-products of several nut-bearing coniferous trees. It is suggested that, because of various economic features, it is not improbable that farmers 1000 years from the present time will include nut-bearing pine trees among their standard crops.—E. C. Auchter.

1458. MOTTET, S. Les Benoites. [Geums.] Revue Hort. 92: 160. 1 pl (colored). 1920.—The 2 varieties, Mrs. Bradshaw and a similar large-flowered, double, scarlet form of *Geum coccineum*, the orange flowered *G. Heldreichii* and its variety *splendens*, which has clear yellow flowers, are most generally useful. *G. montanum*, *G. pyrenaicum*, *G. triflorum*, and *G. reptans* are useful in semi-shaded situations in rockeries; all are easily propagated.—E. J. Kraus.

1459. NASH, GEORGE V. *Clethra barbinensis*. Addisonia 5: 41. Pl. 181 (colored). 1920.—The species is a shrub or small tree, native of eastern Asia, which propagates readily in moist peaty or sandy soil.—T. J. Fitzpatrick.

1460. NASH, GEORGE V. *Crataegus phaenopyrum*. Addisonia 5: 33. Pl. 177 (colored). 1920.—This hawthorn is a native of southeastern U. S. A. It is highly ornamental because of the abundance of flowers, highly colored fruit, and autumnal coloring of the leaves. It was early cultivated in Europe and to a limited extent in the U. S. A.—T. J. Fitzpatrick.

1461. NASH, GEORGE V. *Solidago rugosa*. *Addisonia* 5:43, 44. *Pl. 182 (colored)*. 1920.—The species is a golden-rod of easy culture, preferring open sunny places, and native of eastern North America.—*T. J. Fitzpatrick*.

1462. NASH, GEORGE V. *Stephanandra tanakae*. *Addisonia* 5: 37. *Pl. 179 (colored)*. 1920.—This shrub of the rose family is native of Japan. It is of easy culture and is well adapted to shrub borders or rocky banks.—*T. J. Fitzpatrick*.

1463. NASH, GEORGE V. *Viburnum sieboldii*. *Addisonia* 5: 35, 36. *Pl. 178 (colored)*. 1920.—The present species is a shrub or small tree, native of Japan, recently introduced into the U. S. A. It is suitable as a background for small shrubs.—*T. J. Fitzpatrick*.

1464. PROSCHOWSKY, A. ROBERTSON. *Palms of the Riviera*. *Gard. Chron.* 69: 127-128. *Fig. 56*. 1921.—Next to *Phoenix canariensis*, the so-called California Fan-leaved palm, *Washingtonia filifera*, is the commonest. While introduced to the Riviera less than 40 years ago, it is of such rapid growth that specimens are now found 15 m. or more high and trunk 3 m. in circumference. The plant is briefly described. *Washingtonia robusta*, introduced about 10 years later, grows about twice as rapidly, being the most rapidly growing of all palms for temperate climates. The variety *gracilis* grows less rapidly and has smaller leaves, however of a better green color. *W. filifera* has proved absolutely hardy notwithstanding that on Dec. 17, 1920, the most severe frost known on the Riviera for 100 years or more occurred.—*P. L. Ricker*.

1465. S., F. L. *Clematis jeuneiana*. *Gard. Chron.* 69: 159. 1921.—This species is related to *C. armandi*, *C. pavoliniana*, and *C. meyeniana*. It was previously illustrated [*Gard. Chron.* 69: 135. *Fig. 59*. 1921] and considered by the author to be a garden hybrid, being exactly intermediate between *C. armandi* and one of the other 2 forms. The name has been accepted by the Royal Horticultural Society. The editors also point out the close resemblance in sound of this name to *C. jouiniana*. CECIL HANBURY also states that the material is probably a seedling raised at La Mortola from seeds of *C. armandi* sent to his father from western China by E. H. WILSON, which he sent his brother-in-law, Capt. B. H. B. SYMONSJEUNE.—*P. L. Ricker*.

1466. SMALL, JOHN K. *Grossularia curvata*. *Addisonia* 5:47, 48. *Pl. 184 (colored)*. 1920.—This gooseberry is a native of Georgia and Alabama. It was discovered near Atlanta, Georgia, in 1905, and has recently been introduced into cultivation.—*T. J. Fitzpatrick*.

1467. TURBAT, E. *Les belles roses nouvelles ou récentes*. [Good roses new or recent.] *Revue Hort.* 92: 156-157. 1920.—The following varieties are specifically noted: Everblooming climbers; Climbing Marquise de Sinety, Climbing Richmond, Climbing Sunburst, each a bud variation of the standard variety of the same name; small-flowered everblooming multiflora climbers, Climbing Orléans rose, Ghislaine de Féligonde, Marie Jeanne; climbing, non-everblooming hybrids of Wichuraiana, Casimir Moullé, Coronation, Paul's Scarlet Climber, Paul Noël, Petit Louis, Source d'Or, Troubadour; climbing, non-everblooming multiflora, Crimson grandiflora, Louis Sauvage, White Merville (White Tausendschön). The name of the introducer, date of introduction, and short description are given for each variety.—*E. J. Kraus*.

## VEGETABLE CULTURE

1468. BUSHNELL, JOHN W. *The fertility and fruiting habit in Cucurbita*. *Proc. Amer. Soc. Hort. Sci.* 17: 47-51. 1920 [1921].—Work at the Minnesota Experiment Station during the years 1915-1920 has definitely proved that hubbard squash (*Cucurbita maxima*) is self-fertile. No inherited self-sterility was encountered during the progress of the experiment. In a study of the influence of weather, time of day, and stage of flower development at time of pollination upon set of fruit, it was found that successful pollinations may be made "(1) under a wide range of weather conditions, (2) at any time of day, (3) at any time during the period that the flowers are open." Abortions were numerous in hand-pollinated flowers, but these



could not be correlated with the above factors. Usually the first appearing pistillate flower aborts, then the next flower or flowers are followed by a series of abortions, which in turn are followed by another set. This periodic setting of fruit was also noted in the only open-pollinated plant under observation.—*H. A. Jones.*

1469. LAVENDER, W. The French method of growing asparagus. *Gard. Chron.* 69: 129. 1921.—The ground is first plowed to a depth of 12-14 inches in autumn after thorough dressing with manure. The surface is left rough during the winter. The best results are obtained in sandy loam. In heavy lands, a large quantity of gritty soil should be added. Reliable stock is essential and one of the largest growers never plants roots over 1 year old as they make better growth than older roots. Cutting can begin cautiously the 3rd year after planting, but only 2 or 3 stems are taken from each stool. When the stools are ready for planting, the roots are spread out in a shallow trench and covered with not over 2 inches of rich compost. During the first 2 seasons catch crops are planted between the rows but before the 3rd spring the roots are earthed up with little hillocks 1 foot high. Plants are placed 3-4 feet apart according to soil and amount of manure applied. Fresh manure is not necessary each season, but the largest stalks are secured by good fertilizing. In the vicinity of Paris, road sweepings are applied. If the stalks are preferred green rather than blanched, only a small amount of soil is placed over the stools.—*P. L. Ricker.*

1470. LLOYD, J. W. The effect of "nipping" muskmelon vines. *Proc. Amer. Soc. Hort. Sci.* 17: 126-128. 1920 [1921].—Nipping of the terminal bud of muskmelon vines under field conditions in Illinois was found to be impracticable, both from the standpoint of earliness and total production. In an average of 8 tests the nipped vines produced .99 pounds per hill of early melons and the vines not nipped 1.02. The average total yield from nipped vines was 3.14 pounds per hill while the vines not nipped produced 3.49. The author concludes that earliness and productiveness in muskmelons may better be promoted by liberal fertilizing and careful tillage to encourage vigorous vine growth than by nipping vines to force the formation of laterals.—*H. A. Jones.*

1471. RAPP, C. W. Some important factors in snap bean production. *Proc. Amer. Soc. Hort. Sci.* 17: 116-119. 1920 [1921].—Work at the Oklahoma Agricultural Experiment Station has shown that bacterial blight of snap beans, caused by *Bacterium phaseoli*, can be controlled by planting aged seed on disease-free soil. Infected seed stored for 2 years and planted on disease-free soil produced disease-free plants. The germination average of 4 varieties of snap beans under field conditions after 1, 2, 3, 4, and 5 years' storage was 92, 91, 70.5, 58, and 22 per cent respectively.—*H. A. Jones.*

1472. WELLINGTON, R. Report on vegetable investigations being carried on by experiment stations and similar institutions. *Proc. Amer. Soc. Hort. Sci.* 17: 267-275. 1920 [1921].—A compilation is presented of some of the more important vegetable experiments being conducted in the U. S. A. and Canada. The author has divided the field, grouping projects of similar nature under the same head, as follows: (1) Rotation and fertilizer experiments; (2) soil composting; (3) cultural methods; (4) pruning, training, and suckering; (5) study of plant variations, habits, and adaptations; (6) breeding and selection; (7) pollination studies; (8) use of electricity; (9) cost of production studies; (10) degeneracy of white potatoes and disease studies; (11) storage investigations; and (12) test of varieties.—*H. A. Jones.*

### HORTICULTURE PRODUCTS

1473. BENTLEY, C. M. Problems confronting the canning industry. *Monthly Bull. Dept. Agric. California* 9: 643-649. 1920.

1474. CHRISTIE, A. W. Efficiency in dehydration. *Monthly Bull. Dept. Agric. California* 10: 75-82. 1921.—The author treats in detail the various factors concerned in dehydration of fruit and points out the channels for economy in each of the main factors. The preparation of fruit for dehydration,—sulphuring, lye-dipping, etc.,—and the processing and packing of the dried product are fully discussed.—*E. L. Overholser.*

1475. CHRISTIE, A. W. Some observations in the dehydration of apricots, peaches, and grapes. *Monthly Bull. Dept. Agric. California* 10: 94-95. 1921.—The formation of "air zones" in the tunnel causes lack of uniformity in drying. This can be avoided by increasing the speed of air flow through the tunnel. Screen trays are inadvisable because of the corrosive action of sulphur fumes on the metal.—*E. L. Overholser*.

1476. COLE, W. R. Extension work in horticultural manufactures in Massachusetts. *Proc. Amer. Soc. Hort. Sci.* 17: 95-98. 1920 [1921].

1477. CRUESS, W. V. Observations in the evaporation of pears, prunes and figs. *Monthly Bull. Dept. Agric. California* 10: 88-93. 1921.—Locality is a factor in the suitability of pears for evaporation only in so far as it causes a difference in the sugar content of the fruit. The fruit of highest sugar content yields dried products best in color, texture, and flavor. The control of temperature and relative humidity is important, especially in the case of pears. There is no noticeable difference in the yield of dried product from sun drying and evaporation.—*E. L. Overholser*.

1478. DAVIES, S. M. Loss of citric acid in limes and lime juice. *Agric. News [Barbados]* 20: 75. 1921.—The author made tests with sets of 50 limes of various degrees of ripeness to determine the loss of citric acid in rotten fruit. The limes were hand-pressed, the juice of each set measured and acidity determined. Calculated in terms of citric acid per barrel, the results were as follows: Ripe yellow limes, 5.3 pounds, yellow green limes 4.9, overripe limes 4.6, green limes 4.4, and mushy rotten limes 1.7. To determine the losses of citric acid on storing lime juice, 200 pounds, fresh from the mill and stored in a half tub to a depth of 11-12 inches, were allowed to stand under cover; the scum was not disturbed except in lifting the tub on and off a scale at frequent intervals. After 19 days the juice had lost 16 pounds by evaporation and the acid was reduced from 12.1 to 11.3 ounces equivalent to 10.4 ounces of the original volume. This represents a loss of 1.7 ounces of citric acid per gallon, or 14 per cent of the original acid content. The scum showed a thick layer of *Saccharomyces mycoderma*,—an active reducer of citric acid,—accompanied by a considerable growth of bacteria.—*J. S. Dash*.

1479. JONES, B. J. A successful co-operative evaporating plant. *Monthly Bull. Dept. Agric. California* 10: 82-85. 1921.—Certain details in pre-treatment of fruit for dehydration to secure attractive products are mentioned, as, for instance, a certain amount of peeling is essential to prevent the "curling" of the fruit.—*E. L. Overholser*.

1480. SWETT, F. T. Relation of fruit by-products to horticulture. *Monthly Bull. Dept. Agric. California* 10: 66-70. 1921.—The author reviews the field of possibilities of fruit products in California, and lays stress on the economic importance of solving the several problems confronting the farmer and manufacturer of to-day.—*E. L. Overholser*.

## MORPHOLOGY, ANATOMY, AND HISTOLOGY OF VASCULAR PLANTS

E. W. SINNOTT, *Editor*

(See also in this issue Entries 1133, 1181, 1208, 1256, 1258, 1331, 1385, 1386, 1414, 1552)

1481. ANONYMOUS. A plant that feeds on animals. *Sci. Amer. Monthly* 3: 218. *Fig. 1-3*. 1921.—A description is given of the mechanism of the bladders of *Utricularia vulgaris*.—*Chas. H. Otis*.

1482. BOUYGUES, H. Considerations sur l'endoderme. [Considerations on the endodermis.] *Compt. Rend. Acad. Sci. Paris* 172: 332-335. 1921.—Petioles, rhizomes, stems, and leaf veins were studied. The author concludes that the endodermis cannot be considered as a constant anatomical feature delimiting the cortex from the fibro-vascular system.—*C. H. Farr*.



1483. BRADLEY, CORNELIUS BEACH. The phyllotaxy of *Phoenix canariensis*. *Torreya* 21: 37-44. Pl. 1-2, 1 chart. 1921.—A study of ornamental specimens of *Phoenix canariensis* grown in and about Berkeley, California, shows that the leaf arrangement is not of a single and stable pattern. Each tree has passed through several distinct phases of phyllotaxy. Three zones representing regular patterns, the 5-, 13-, and 34-ranked, are recognized, and the intervals between are occupied by 2 groupings not belonging to any of the ordinary alignments. The interfoliar arc is gradually changed so as to build up these transitional formations, causing the vertical ranks to swerve in the direction of the primary spiral. This rotation of the pattern is continued until some one of the secondary ranks becomes vertical, after which another regular pattern begins. The chart illustrates the sequence of patterns in the 5 phyllotactic zones.—J. C. Nelson.

1484. BRIQUET, J. La structure foliaire des *Hypericum* à feuilles scleromarginées. [Foliar structure of *Hypericum* species having leaves with indurated margins.] *Compt. Rend. Soc. Phys. et Hist. Nat. Genève* 36: 75-79. 1919.—In certain species of *Hypericum*, the leaves are reinforced along their margins by a thickening that unites with the veins in a way suggesting that it constitutes a portion of the fibro-vascular system. Three species, *H. pimelaoides* Pl. and Lind, *H. cordiforme* St. Nil, and *H. connatum* Lamk. were studied to determine whether such a condition actually occurred. The thickenings were found to be composed in some cases of an exaggerated development of epidermal covering; in other cases, of greater development of collenchyma. The function appears to consist in permitting the leaf to retain its form during periods of intense transpiration and to resist tearing.—Charles Drechsler.

1485. BRIQUET, J. Les trichomes foliaires des *Centaurées* Phrygiées. [The foliar trichomes of species of *Centaurea*.] *Compt. Rend. Soc. Phys. et Hist. Nat. Genève* 36: 96-102. 1919.—The hairs of *Centaurea* spp. consist of 2 parts; the foot, composed of 2 or more relatively broad cells, and the flagellum, composed of a single elongated slender cell, the contents of which dies soon after its development. The flagellum is often early caducous, leading to a variety of conditions described as harsh, hirsute, etc., although where it remains attached a tomentose condition obtains. The shedding of the flagellum is related to a fold along its base. Trichomes are described in detail for *C. procumbens* Balb., *C. Jordaniana* Godr. and Grev., *C. pectinata* L., *C. uniflora*, *C. phrygia* L. emend., *C. rhaetica* Moritzzi, *C. trichocephala*, *C. hyssopifolia* Vahl., *C. linifolia* Vahl., and *C. antennata* Duf. In general, 3 types may be distinguished, 1 with a cylindrical foot, a 2nd with a conical foot, and a 3rd with the foot irregular. From an ecological standpoint the trichomes serve to reduce evaporation while the leaf is young by surrounding the leaf in a dead air space confined within the cottony or tomentose layer formed by the flagella.—Charles Drechsler.

1486. CAMPBELL, DOUGLAS HOUGHTON. The gametophyte and embryo of *Botrychium obliquum* Muhl. *Ann. Botany* 35: 141-158. Pl. 7, 11 fig. 1921.—The gametophyte of *Botrychium obliquum* is similar to those of other species of the genus. The embryo, however, differs in several important respects from those of the other 2 species, *B. Lunaria* and *B. virginianum*, which have been studied and which with *B. obliquum* represent the 3 types of adult sporophytes found in the genus. It differs in the endogenous origin of the root, in the bipolar arrangement of cotyledon and root, and especially in the presence of a suspensor. The embryo is in fact much more like those of some species of *Ophioglossum* and *Danaea* than it is like those of other species of *Botrychium*. It has previously been shown that the embryos of *B. Lunaria* and *B. virginianum* are very different from each other. The author believes that if further investigation shows that other species of the *Ternatum* group agree with *B. obliquum* in regard to the embryo, there is ample reason for separating off this section as a new genus, and also that *B. virginianum* differs sufficiently from the other species to deserve generic rank. The present genus would thus be divided into 3. The development of the embryo, including the apical regions of stem, cotyledon, and root, as well as the vascular system, is worked out in detail.—W. P. Thompson.

1487. COLLINS, MARJORIE I. On the structure of the resin-secreting glands in some Australian plants. *Proc. Linn. Soc. New South Wales* 45: 329-336. Fig. 1-12. 1920.—A descrip-

tion is given of the occurrence and development of glandular hairs in *Dodonaea viscosa* Linn., *Acacia rupicola* F. v. M., *A. armata* R. Br., *A. pycnantha* Benth., *A. verniciflua* Cunn., *Ixodea achilleoides* R. Br., *Helichrysum semipapposum* De Cand., *Humea cassiniacea* F. v. M., *Myoporum serratum* var. *insulare* R. Br., *Myoporum serratum* var. *viscosum* R. Br., and *Eremophila latifolia* F. v. M. The facts observed throw light upon the structure of the mature gland and are of systematic value.—*Eloise Gerry*.

1488. FLETCHER, J. J. Presidential address. Proc. Linn. Soc. New South Wales 45: 1-47. Pl. 1-8. 1920.—On pages 24-47 the author discusses The Correct Interpretation of the So-called Phyllodes of the Australian Phyllodineous Acacias. It is suggested that the Australian phyllodineous Acacias should be distinguished from ordinary "phyllodes," (phyllodium = "a petiole usurping the form and function of a leaf-blade," Gray), although this definition was originally intended to apply to the flattened leaf-substitutes of these plants. In the Acacias these structures are neither cladodes nor phylloclades as these terms are currently defined. The author, having determined this, proposes the name Euphyllodineae since the so-called euphyllodes of the Australian Acacias are more than simply flattened petioles. Rather they are considered vertically flattened primary leaf axes or common petioles, with pinnae suppressed, which have usurped the form and function of leaves. The leaf development is traced through the seedling stages, species are compared and illustrated, and analogies with other existing bipinnate species discussed. The incorrectness of current ideas about phyllodes is due to: (1) Neglect to determine the mode of succession of the pairs of pinnae in the development of the bipinnate leaves; (2) non-recognition or disregard of the meaning and significance of the presence of Bentham's "seta terminalis" or "recurved or excurrent point" of the common petiole or of its distal component, the rhachis, due recognition of which, especially in seedlings with only 1 pair of pinnae, is the key to the understanding of the euphyllodia; (3) failure to take into account the fact that the petioles or apparent petioles of known Australian bipinnate Acacias are short relative to the length of the entire primary leaf-axes or common petioles whereas the so-called phyllodes are longer than the petioles. Reversion-foliage, its characteristics and its absence in several species, is discussed and figured.—*Eloise Gerry*.

1489. HOCHREUTNER, B. P. G. Le carpocratère, un nouvel organe du fruit des Malvacées. [The carpocrater, a new organ of the fruit of Malvaceae.] Compt. Rend. Soc. Phys. et Hist. Nat. Genève 36: 80-81. 1919.—The author found in all species of *Cristaria* a cup-like structure at the base of the fruit, the function of which seems to be first protective, and then to facilitate the dissemination of the seed. This structure, which has not been mentioned before, is designated as a *Carpocrater*.—*Charles Drechsler*.

1490. HOLMES, M. G. A contribution to the study of water-conductivity in sycamore wood. Ann. Botany 35: 251-268. 13 fig. 1921.—This paper is a continuation of studies [see Bot. Absts. 3, Entry 1109] on the constitution of the wood of shoots of various species in relation to their efficiency in the conduction of water and deals with the sycamore (*Acer pseudoplatanus*). The wood of the 1st year shows a general similarity to those previously studied. The area of the wood in transverse section, the water conducting area in this wood, and the total number of water conducting elements all show, as in previous cases, a simple decline from base to apex. The specific conductivity rises and then falls, and its value is in general near that of hazel and higher than that of ash. The author made observations also on 2nd and later annual rings finding less variation in specific conductivity than in 1st year wood; also the specific conductivity is somewhat lower in value because the vessels are less abundant though wider.—*W. P. Thompson*.

1491. JEFFREY, EDWARD CHARLES, AND RAY ETHAN TORREY. Transitional herbaceous dicotyledons. Ann. Botany 35: 227-250. Pl. 11-13, 5 fig. 1921.—BAILEY and SINNOTT have criticized the theory that the herbaceous type in dicotyledons has been evolved from the arboreal type by the formation of large rays in relation to the entering leaf-traces, maintaining that it was in large part merely the result of the progressive thinning of the vascular cylinder. The present article is in reply to their criticisms, contradicting many of their statements of



fact as well as their conclusions and supporting the original theory. Special care is taken to advance evidence that the large rays in many herbs are subtended by leaf-trace bundles since a statement that this condition is rarely found constituted the chief criticism of the theory. A comparison in regard to ray conditions is made between nearly related trees and herbs in a wide variety of natural groups, including Malvales, Urticales, Ranales, Leguminosae, Scrophulariaceae, and Compositae. From the facts brought out it is concluded that a practically never-failing distinction between trees and the aerial axes of woody herbs is the formation in the latter of large rays about the incoming leaf-traces, these rays being well-developed radially but only slightly extended vertically. In less woody herbs the foliar rays become reduced radially because of the thinning of the woody cylinder but at the same time become elongated vertically. The vertical extension results in the division of the cylinder into a series of separate strands. Finally, in the extreme herbaceous condition the woody cylinder is thinned to such a degree that the radial extension of the foliar rays is eliminated. This condition is associated with a great development of those portions of the ray on each side of the leaf-trace.—*W. P. Thompson.*

1492. MAILLEFER, ARTHUR. Les mouvements hygroscopiques des rameaux de l'ombelle de *Daucus Carota* L. [Hygroscopic movement in the branches of the umbel of *Daucus Carota*.] Bull. Soc. Vaudoise Sci. Nat. 52: 385-394. Fig. 1-10. 1919.—The hygroscopic effect, as manifested in bending, was found to be greater in the distal than in the proximal half of the branches of the umbel. In the proximal portion the vascular system is represented by numerous fibrovascular bundles of highly lignified, obliquely pitted elements, the bundles united into a cylindrical structure by masses of fibers with little dorsiventral differentiation. The distal part is dorsiventral in structure. On the upper adaxial side is an arch of 4 vascular bundles, the 2 uppermost obliquely pitted, the 2 lateral ones transversely. As the latter are capable of greater elongation, a mechanical differentiation is brought about between lateral and uppermost bundles, which causes the movements observed. The bundle on the lower side tends to oppose movement, but is not large enough to prevent it. By observing the action of longitudinal sectors of branches, the author obtained evidence that KLEINS' view (that movement is due to difference in activity between abaxial and adaxial bundles) is erroneous. There is a marked degree of dorsiventral differentiation with respect to presence of sclerenchyma. MARTEL is wrong in assigning a major mechanical rôle to this, however, although it may be effective in the nyctitropic movements occurring before the ripening of the fruit.—*Charles Drechsler.*

1493. MAILLEFER, ARTHUR. Sur le développement de la structure anatomique de la tige d'*Impatiens Roylei* Walpers. [Development of the anatomical structure of the stem of *Impatiens Roylei* Walpers.] Bull. Soc. Vaudoise Sci. Nat. 52: 237-274. Fig. 1-27. 1919.—The young hypocotyl of this species shows 4 strands of protoxylem between each 2 of which may be distinguished 2 groups of phloem elements. The epidermis, a single layer of cells, overlies a layer of collenchyma cells which is separated from the endodermis by a thick cortex. Metaxylem cells begin to appear on the inner side of the protoxylem groups, which gradually disappear. The phloem now increases in mass and the cambium begins to appear and forms secondary wood near the lateral edges of the primary wood. A cavity results from the degeneration of the central portion of the pith. The secondary wood cells gradually assume isolated positions toward the center of the stem. The mature hypocotyl shows a layer several cells thick immediately inside the endodermis, the pseudopericycle. The cambium ceases to function after forming a considerable layer of fibers and vessels. Secondary parenchyma rays are present, distinct from medullary rays and having no relation to the pith.—The development of the stem is followed in the same way. In mid-summer a longitudinal section shows the tissues in the following order: Epidermis, dermal collenchyma, cortical cells, endodermis, phloem, cambium, pitted vessels, woody fibers, collenchymatous woody parenchyma, scalariform vessels, spiral vessels, and pith. Short sections are devoted to the structure of the phloem, the course of the vessels, the structure of adventitious roots, and the distribution of anthocyan in the epidermis.—*Charles Drechsler.*

1494. MOLLIARD, M. Sur des phénomènes tératologiques survenant dans l'appareil floral de la Carotte à la suite de traumatismes. [Teratological phenomena resulting from wounding the inflorescence of the carrot.] Compt. Rend. Acad. Sci. Paris 172: 473-475. 1921.—The author reports a study of the wounding effects of grazing cattle upon the form and structure of the inflorescence of the carrot. Double flowers are reported, some that were almost without petals, and still others with neither stamens nor petals.—C. H. Farr.

1495. PURVIS, O. N. The effect of potassium salts on the anatomy of *Dactylis glomerata*. Jour. Agric. Sci. 9: 338-365. 23 fig. 1919.—Thickness of walls, diameter of lumina, and the ratio of lumen to wall were measured both in sclerenchyma and metaxylem elements of stems of *D. glomerata* grown on plots receiving different manurial treatments as regards potash. Where potash was supplied the sclerenchyma walls were thinner in early stages, but this effect was lost as the season progressed. Under the same conditions the lumina were larger than normal; but in the presence of ammonium salts this effect was reversed. The thickness of walls in the xylem was unaltered whether potassium was added or not, but the diameter of the lumen was reduced in the presence of potash. In the latter case the addition of ammonium salts with potash resulted in an increase in diameter.—The addition of potassium salts gave an increased ratio of lumen to wall, but the effect gradually disappeared. It is concluded that fertilization with potassic fertilizers reduces the strength of mechanical cells in the early stages of growth unless, indeed, the salts affect the composition of the wall. The rigidity of plants supplied with potassium salts is not the result of anatomical strengthening but must be attributed to other causes, such as the effect of the salts on the physiological condition of the plants.—D. Reddick.

1496. RUSBY, H. H. A strange fruit. Torreya 21: 47-50. 1 fig. 1921.—A description is given of the Mexican *Jarilla Sesseana* (Ramirez) Rusby. The fruit seems reversed in form, the thickened and elongated style simulating a peduncle, and the 5 fleshy curved appendages at the base resembling calyx lobes. The author regards this form as specifically distinct from *J. heterophylla*.—J. C. Nelson.

1497. SAHNI, B. Note on the presence of a 'tent-pole' in the seed of *Cephalotaxus pedunculata*. Ann. Botany 35: 297-298. 2 fig. 1921.—The seed of *Cephalotaxus pedunculata* shows a small apical prolongation of the female prothallus which props up the nucellar membrane somewhat after the fashion of a tent-pole. This is a strong Cordaitalean characteristic and the similarity is mentioned as additional evidence in support of the Cordaitalean affinity of the Taxales.—W. P. Thompson.

1498. SEELIGER, RUDOLF. Die Abstoszung der primären Rinde und die Ausheilung des Wurzelbrandes bei der Zuckerrübe (*Beta vulgaris* L. var. *rapa* Dum.). [Sloughing of the primary cortex and healing of root canker in the sugar beet.] Arbeit. Biol. Reichsanstalt Land- u. Forstw. 10: 141-148. Pl. 1, 3 fig. 1919.—In the absence of parasitic fungi no discoloration is produced in the cortex tissue at the time of the sloughing of the primary cortex; and the remains of such tissue on the hypocotyl are uncolored. When parasitic fungi are present the sloughing of the primary cortex is always accompanied by a greenish-brown, brown, or blackish-brown coloration of the infected tissue, but it is not possible to determine the degree of infection from the degree of color produced. Healing takes place unless the infection has passed beyond the tissue which is cast off. RÜGGERBERG's investigations of this same problem were carried on with plants grown in water cultures. Parasitic fungi present in the water cultures caused the discolorations reported by this author and his conclusions are not, therefore, descriptive of the normal conditions.—Reginald H. Colley.

1499. SEELIGER, RUDOLF. Untersuchungen über das Dickenwachstum der Zuckerrübe (*Beta vulgaris* L. var. *rapa* Dum.). [Investigations on the growth in thickness of the sugar beet.] Arbeit. Biol. Reichsanstalt Land- u. Forstw. 10: 149-194. Pl. 2, 21 fig. 1919.—The author investigated the morphology of the sugar beet from the seedling stage through 1 year's growth, and finds that the primary epidermis is soon divided off from the fundamental tissue of the root



and hypocotyl, that the annular and spiral vessels of the primary wood are cut off from functioning, and that the sieve tubes and companion cells are obliterated; but the pericycle, the metaxylem, and the parenchyma cells of the primary wood, and the parenchyma cells of the primary bast retain their functions. The normal circle of vascular bundles arises from a row of cells in the central cylinder. The primary medullary rays are formed by cells from the pericycle. The extra-fascicular vascular bundle circle arises from a meristem originating either in the pericycle or in the parenchyma of the primary bast. In the hypocotyl the fascicular meristem in the pith develops from the pericycle, whereas that outside the pith develops either from the pericycle or the parenchyma of the primary bast. In the root the fascicular meristem usually develops from the parenchyma of the primary bast. Storage tissue develops from parenchyma cells of the bast of the vascular rings and from medullary ray tissue. The outer cells of the pericycle develop into a phellogen several layers thick.—*Reginald H. Colley.*

1500. SOUÈGES, RENÉ. Embryogénie des Scrophulariacées. Développement de l'embryon chez le *Veronica arvensis*. [Embryogeny of the Scrophulariaceae. The development of the embryo of *Veronica arvensis*.] Compt. Rend. Acad. Sci. Paris 172: 703-705. Fig. 1-17. 1921.—The stages of development of the embryo of *Veronica arvensis* are described. They are found to be quite similar to those of *Oenothera* and the Cruciferae.—*C. H. Farr.*

1501. VUILLEMIN, PAUL. La zygomorphose endogène dans les fleurs normalement actinomorphes. [Endogenous zygomorphosis of flowers which are normally actinomorphic.] Compt. Rend. Acad. Sci. Paris 172: 428-431. 1921.—The types and examples are given of modifications of normally actinomorphic flowers into zygomorphic ones. Modifications of position of 2 types are described; namely, radial and circular displacement. Two types of modification of configuration are also defined, namely, homologous substitution and disproportion. Modification in number may be either discordant oscillation, abortion with addition of supplementary members, or the development of complementary members.—*C. H. Farr.*

1502. VUILLEMIN, PAUL. La zygomorphose exogène dans les fleurs normalement actinomorphes. [Exogenous zygomorphosis of flowers which are normally actinomorphic.] Compt. Rend. Acad. Sci. Paris 172: 514-517. 1921.—Types and examples of exogenous zygomorphosis are given. The 3 main types distinguished are synanthic and parasynanthic zygomorphosis and zygomorphosis at a vegetative junction.—*C. H. Farr.*

## MORPHOLOGY AND TAXONOMY OF ALGAE

E. N. TRANSEAU, *Editor*

(See in this issue Entries 1503, 1674)

## MORPHOLOGY AND TAXONOMY OF BRYOPHYTES

ALEXANDER W. EVANS, *Editor*

1503. BOULGER, G. S. The cryptogams of Andrews' Herbarium. Jour. Botany 57: 337-340. 1919.—This list is supplementary to a list of phanerogams. Notes are presented on 1 fern, 12 mosses, 6 hepatics, 21 algae, 4 lichens, and 7 fungi.—*K. M. Wiegand.*

1504. EVANS, ALEXANDER W. *Taxilejeunea pterogonia* and certain allied species. Bull. Torrey Bot. Club 48: 107-136. Pl. 2, 22 fig. 1921.—The following species, which represent a clearly defined group, are treated: *Taxilejeunea pterogonia* (Lehm. & Lindenb.) Schiffn., widely distributed in tropical America; *T. jamaicensis* sp. nov., known only from Jamaica; *T. densiflora* sp. nov., known only from Jamaica and Colombia; and *T. debilis* (Lehm. & Lindenb.) Steph., widely distributed in tropical America.—*P. A. Munz.*

1505. HOLZINGER, J. M., AND T. C. FRYE. Mosses of the Bureau of Soils Kelp Expedition to Alaska. Publ. Puget Sound Biol. Sta. 3: 23-64. 32 fig. 1921.—A list is given of the mosses

collected by the Kelp Expedition in 1913, together with other unreported Alaskan species sent from time to time to the University of Washington. The species enumerated number 198 and the varieties 25. *Camptothecium paulianum* Grout from St. Paul Island and *Hypnum tananae* Grout from Tanana are described as new species, and *Aulacomnium androgynum pygmaeum* from Mitrofan Bay as a new variety. The following new combinations are likewise proposed: *Brachythecium pacificum* (Ren. & Card.) Grout, based on *B. reflexum pacificum* Ren. & Card.; and *Trachycystis pellucida* (Williams), based on *Bryobrittonia pellucida* Williams. The list includes 44 species and 11 varieties of mosses reported for the first time from Alaska. Two of the species, *Geheebia gigantea* (Funck) Boulay and *Zygodon reinwardti* (Hornsch.) Al. Braun, represent additions to the North American flora. Critical notes are interspersed throughout the article, and the recognition of the genera *Geheebia* and *Trachycystis* is suggested. The figures, arranged on 4 plates, were drawn by E. B. CHAMBERLAIN and represent *Bryobrittonia pellucida*, *Dicranella squarrosa* (Schrader) Schimp., and *Trachycystis flagellaris* (Sull. & Lesq.) Lindb.—*T. C. Frye*.

1506. LUISIER, A. *Fragments de bryologie ibérique*. [Notes on Iberian bryology.] *Broteria* Ser. Bot. 19: 5-11. 1921.—The 1st part of the article catalogues a collection of mosses made at Oña in the province of Burgos; *Campylium Sommerfeldtii* (Myr.) Bryhn is reported for the first time from Spain, and a supplementary list indicates the species previously known from the province. The 2nd portion of the article deals with the distribution on the Iberian peninsula of *Triquetrella arapilensis* Luis., *Brachymenium lusitanicum* (Luis.) Hagen, and *Cladopodium Whippleanum* Sull.—*E. B. Chamberlain*.

1507. LUISIER, A. *Les mousses de Madère*. [Mosses of Madeira.] *Broteria* Ser. Bot. 19: 36-48. 1921.—The present installment of this series [see Bot. Absts. 7, Entry 351] comprises the keys to the 1st part of the Pottiaceae.—*E. B. Chamberlain*.

1508. MEYLAN, CH. *Note sur une nouvelle espèce de mousse*. [On a new species of moss.] *Bull. Soc. Vaudoise Sci. Nat.* 52: 383-384. 1919.—A new species, *Desmatodon Wilczekii*, collected at an altitude of 2600 m., is described. It represents a form intermediate between *Desmatodon* and *Pottia*, resembling the former genus in its gametophyte and the latter in its capsule. The spores measure 25-35  $\mu$  and are minutely papillate. Maturing in August, the operculum remains attached to the summit of the columella as in the genus *Hymenostylium*; no peristome is present.—*Charles Drechsler*.

## MORPHOLOGY AND TAXONOMY OF FUNGI, LICHENS, BACTERIA, AND MYXOMYCETES

H. M. FITZPATRICK, *Editor*

(See also in this issue Entries 1308, 1309, 1318, 1323, and others in the section Pathology)

### FUNGI

1509. BIJL, PAUL A. VAN DER. *Note on Lysurus Woodii* (MacOwan) Lloyd. *Trans. Roy. Soc. South Africa* 9: 191-193. *Pl.* 11. 1921.—The nomenclature of *Lysurus Woodii* and its relation to other species of the genus are discussed.—*E. M. Doidge*.

1510. BIJL, PAUL A. VAN DER. *South African Xylarias occurring around Durban, Natal*. *Trans. Roy. Soc. South Africa* 9: 181-183. *Pl.* 7-8. 1921.—Four species of *Xylaria* occur in the neighborhood of Durban, namely *Xylaria multipler*, *X. apiculata*, *X. anisopleura*, and *X. polymorpha*. Three of these have not been previously recorded from South Africa.—*E. M. Doidge*.



1511. BIJL, PAUL A. VAN DER. The genus *Tulostoma* in South Africa. Trans. Roy. Soc. South Africa 9: 185-186. Pl. 9. 1921.—Two species of this genus are mentioned as occurring in South Africa, *Tulostoma cyclophorum* and *T. Lesliei*, the latter being described as a new species.—E. M. Doidge.

1512. BURLINGHAM, GERTRUDE S. Some new species of *Russula*. Mycologia 13: 129-134. Pl. 7 (colored), fig. 1-6. 1921.—Six new species are described and illustrated in colors.—H. R. Rosen.

1513. COLLINS, MARJORIE I. Note on certain variations of the sporocyst in a species of *Saprolegnia*. Proc. Linn. Soc. New South Wales 45: 277-284. Fig. 1-11. 1920.—Certain variations in sporocyst formation and discharge are recorded for an undetermined species of *Saprolegnia* growing under both natural and cultural conditions. *Leptolegnia*, *Pythiopsis*, and *Achlya* conditions occurred rarely, *Dictyuchus* and *Aplanes* conditions frequently. These variations occurred in both club-shaped and cylindric sporocysts but were not observed arising from resting sporocysts. The *Dictyuchus* condition differs from both of those described by LECHMERE and is held to be the true *Dictyuchus* condition. Composite sporocysts were observed; the most important combine the features of *Dictyuchus* and *Aplanes* (*Dictyuaplanes*). Evidence is given in favor of the suggestion that the *Aplanes* condition has arisen from the *Dictyuchus* by failure of the protoplast to escape from the germtube during its early growth. New sporocysts are frequently formed as lateral, basal branches of old sporocysts, owing to the blocking of the latter with empty cyst cases and germinating spores.—Eloise Gerry.

1514. COOL, CATH. Het paddenstoeljaar 1920. [The toadstool year 1920.] Levende Natuur 25: 292-298. Fig. 5. 1921.—The occurrence of higher fungi in various parts of the Netherlands during 1920 is reported.—J. C. Th. Uphof.

1515. CURTIS, K. M. The life-history and cytology of *Synchytrium endobioticum* (Schilb.) Perc., the cause of wart disease in potato. Phil. Trans. Roy. Soc. London B 210: 409-478. Pl. 12-16. 1921.—Two forms of reproductive bodies are formed in *Synchytrium endobioticum*, the resting sporangium and the sorus. Zoospores are liberated from the resting sporangium and, after a short period of activity, can infect young tissue of the potato plant. The zoospore penetrates the surface wall of an epidermal cell, a nuclear projection preceding the entrance of the body. It then passes to the lower end of the cell, enlarges and becomes differentiated into nucleus, cytoplasm, and outer membrane. This body is termed the prosorus. A process of repeated nucleolar discharge sets in; chromatin and linin are given off into the nuclear cavity; the chromatin is dissolved, the linin fills the cavity. The prophase of primary mitosis begins after the 3rd discharge. Five delicate strands distinct from the linin mass extend from the nucleolus to the opposite side of the cavity. The prosorus is invested by a thick outer and delicate inner membrane. The host cell enlarges and dies. The cytoplasm and nucleus of the prosorus pass through a pore in the membrane outward into the host cell. Repeated mitosis takes place in the nucleus during and following emergence. The 5 minute spherical chromosomes are believed to originate from a globule given off by the nucleolus. The spindle is intranuclear and the membrane persists until metaphase; centrosomes and asters are absent. After about 5 mitoses the prosorus segments into 4-9 sporangia, the walls of which arise by deposition of cleavage membranes independently of the nuclei. The sporangia remain enclosed within the common membrane. Nuclear divisions occur until 200-300 nuclei are formed in each sporangium. On absorption of water, areas are delineated by intersecting strands of protoplasm and vacuoles which become the zoospores. A blepharoplast lies on the periphery of each area and is connected on the one hand with nucleus and on the other with an adjacent zoospore by deeply staining strands; the latter become cilia. Repeated divisions of underlying host cells elevate the sorus, and division of adjacent epidermal cells produces a rosette surrounding the infected cell. The pressure due to the enlarging sporangia and the swelling of underlying cells ruptures the host cell and soral membrane and frees the sporangia. These in turn rupture at hyaline projections and liberate uniciliate motile cells which seem to be

facultative gametes. Their fusion in pairs was observed and the further development of both the unpaired zoospore and the zygote was followed in detail. Temperature is not the factor determining the sexual or asexual nature of the motile cells of the sorus, but it is believed that when water is withheld after the formation of the zoospores so that a maturation period intervenes prior to their discharge, the simultaneous discharge from several sporangia upon the renewal of a water supply causes the motile cells to act as gametes. It is believed that gametes fuse only with those of another sporangium. The soral zoospores are smaller than those produced by the resting sporangium but are otherwise similar; penetration by both kinds of zoospores and by the zygote is essentially the same. Either type of zoospore gives rise to a prosorus but the zygote produces a resting sporangium. The development of the latter resembles that of the sorus in the earlier stages; the substance of the nucleolus is repeatedly given off into the nuclear vacuole, the chromatin disappears, and a mass of linin remains. Subsequently chromatic granules appear in the cytoplasm; these become differentiated into chromatic and achromatic parts and are the primordia of zoospores. A reduction process is believed to supervene when all the chromatic material of the primordium except a single granule is given off into the cytoplasm; from this granule the nucleus of the zoospore is formed. A blepharoplast upon which the cilium is later inserted is connected with the nucleus by a strand. Mitotic divisions characteristic of the developing sorus are absent in the resting sporangium, and despite the sexual origin of these bodies clear evidence of reduction in their development is wanting. When more than 1 zygote penetrates a host cell the supernumerary cysts are distributed by mitotic divisions of the host cell. In this way resting sporangia come to lie several layers deep in the host tissue. The resting sporangium has a 3-layered membrane; the 2 inner ones are derived from the parasite, the outer from the disorganizing host cell. Rupture of the membrane results from swelling of the innermost layer in a conical internal projection. This species is precisely described by SCHRÖTER's diagnosis of the division *Mesochytrium* of the genus *Pycnochytrium*, but the author prefers to retain FISCHER's generic name *Synchytrium*. Earlier references to the occurrence of giant zoospores with 2 cilia in this group are confirmed by the present study and interpreted as resulting from sexual fusions. The demonstration of the existence of sexuality in all Synchytriaceae which produce true resting sporangia is predicted.—*F. Weiss.*

1516. DOIDGE, ETHEL M. South African Ascomycetes in the National Herbarium. *Bothalia* 1: 5-32. *Fig. 1-5.* 1921.—Fifty ascomycetes are described including the four new genera *MacOwaniella*, *Isipinga*, and *Palawaniella* belonging to the Polystomellaceae, and *Parastigmatea* of the family Stigmateaceae. Descriptions are given of the following new species: *Cycloshizon fimbriatum*, *Cocconia capensis*, *Polyrhizon Bewsii*, *Isipinga areolata*, *Elmerococcum Peglerae*, *Rosenscheldia horridula*, *Parastigmatea nervisita*, *Phragmodothella nervisequen*, *Catacauma Peglerae*, *Scolecodothis capensis*, *Phyllachora Lessertiae*, *Phyllachorella rikatiensis*, *Endodothella natalensis*.—*E. M. Doidge.*

1517. DOIDGE, ETHEL M. South African Perisporiaceae. VI. The haustoria of the genera *Meliola* and *Irene*. *Trans. Roy. Soc. South Africa* 9: 117-127. 7 *fig.* 1921.—The haustoria of several species are examined; the most common type is that which has a fine filament penetrating the cuticle and a small, globular, thin-walled, uninucleate vesicle in the epidermal cell. The nature of the penetrating filament appears to be specific in character and not correlated with the thickness of the cuticle traversed. Certain species penetrate into the first chlorophyll-containing cells of the mesophyll. The character of the penetrating filament is of diagnostic value and may, in some cases, be employed as a determining factor when there is any question of the identity of 2 species.—*E. M. Doidge.*

1518. DURAND, ELIAS J. New or noteworthy Geoglossaceae. *Mycologia* 13: 184-187. 1921.—The author clarifies several species previously described and gives technical descriptions of *Trichoglossum confusum* n. sp. and *T. Wrightii* n. sp., the latter raised to specific rank from *T. hirsutum* forma *Wrightii* Durand.—*H. R. Rosen.*



1519. ELLIS, DAVID. Advances in the study of yeasts. [Rev. of: GUILLIERMOND, A. The yeasts. Translated and thoroughly revised in collaboration with the original author by F. W. TANNER. xix + 424 p. John Wiley and Sons: New York; Chapman and Hall: London, 1920.] (See Bot. Absts. 8, Entry 2057.) Nature 107: 387-388. 1921.

1520. FINK, BRUCE. Notes on the powdery mildews of Ohio. Ohio Jour. Sci. 21: 211-216. Fig. 1-2. 1921.—The article discusses 22 species of Erysipheae, giving localities, hosts, and species not previously reported from Ohio.—H. D. Hooker, Jr.

1521. FOËX, ETIENNE. Liste des champignons récoltés dans le canton de Vaud et principalement à Saint-Cergue pendant l'été 1918. [List of fungi collected in the canton of Vaud, especially near Saint-Cergue during the summer of 1918.] Bull. Soc. Vaudoise Sci. Nat. 52: 457-460. 1919.—The author mentions 59 different species of fungi and the hosts upon which they were collected.—Charles Drechsler.

1522. FOËX, ETIENNE. Note sur un Cordyceps. [On a species of Cordyceps.] Bull. Soc. Vaudoise Sci. Nat. 52: 461-464. Pl. 1, fig. 1. 1919.—The author describes and figures a specimen of *Cordyceps*, not altogether intact, collected in the Forest of the Jorat, that is probably to be referred to *Cordyceps capitata* (Holm.) Link, in spite of some variations from the description of this form. An interesting characteristic of the fungus is found in the filamentous ascospores becoming septate toward maturity, the segments later becoming disarticulated. The discharge of the ascus is accomplished by the ascus wall becoming gelatinous from the base upward, releasing the spore segments, often in a manner permitting the original linear arrangement of the latter to be perceived.—Charles Drechsler.

1523. GIBBS, L. S. Notes on the phytogeography and flora of the mountain summit plateau of Tasmania. Jour. Ecol. 8: 89-117. 1920.—A species of *Morchella*, collected in a Eucalyptus forest on Mt. Dromedary at an elevation of 3000 feet, is described under the name *M. tasmanica* J. Ramsbottom.—Geo. D. Fuller.

1524. HÖHNEL, FRANZ VON. Fungi Imperfecti: Beiträge zur Kenntnis derselben. [Contributions to our knowledge of the Fungi Imperfecti.] Hedwigia 60: 129-208. 1918; 60: 209. 1919.—*Phoma occulta* Desmazières is a typical *Sclerophomella*, closely related to *S. verbascicola* (Schw.) v. H., and is named *S. occulta* (Desm.) v. H. It is the conidial stage of a *Pleospora*, probably *P. vagans* Niessel or *P. infectoria* Fekl. *Sphaeria leptidea* Fr. is not, as stated by VLEUGEL, the conidial stage of *Lophodermium melaleucum* (Fr.) de Not., nor is it a *Sphaerella*, as assumed by FÜCKEL. *Chaetopyrena* Sacc. 1883 is antedated by PASSERINI's genus of the same name published in 1881. On the type specimen of *C. hesperidum* Pass. occurs a *Ceuthospora*. GIBELLI and PENZIG have confounded these 2 different fungi and consequently the valid genus *Chaetopyrena* Pass. is not given in the Syll. Fung. *Ceuthospora phacidiioides* f. *Citri* Penz. cannot be considered identical with *Chaetopyrena hesperidum* Pass. *Sclerochaeta* v. H. 1917 erected on *Phoma penicillatum* Fuckel is identical with *Chaetopyrena Passerini*. Therefore *C. hesperidum* Passerini should be called *C. penicillatum* (Fuck.) v. H.; it is the imperfect stage of a *Pyrenophora*. *Pyrenochaeta destructiva* MacAlp. may be a related *Chaetopyrena*.—*Phyllosticta Rosae* Roberge is discarded. *P. Rosae* Desm. is probably identical with *P. Rosarum* Pass., which is apparently based on the spermogonia of *Phragmidium subcorticium*. *Phyllosticta rosicola* Massalongo is shown to be a *Stictochorella* v. H. and probably belongs to *Sphaerella rhodophila* Passerini. *Phoma exigua* Desmazières is discarded. *Hendersonia* (*Piestospora*) *smilacina* Desmazières is referred to the genus *Cylindrophoma* as *C. smilacina* (Desm.) v. H. The genus *Plenozythia* is referred in von Höhnel's system of the Fungi Imperfecti to the Sphaerioidae-ostiolatae next to *Macrophoma*. All forms of brownish, or olive-brown color, even if soft-fleshy, are placed in the Sphaerioidaceae. Forms with hyaline pycnidia having a brown beak are referred to the Sphaerioidaceae. The same procedure is adopted for the Sphaeriaceae and Hypocreaceae. *Sphaeria Leguminis-Cytisi* Desmazières is referred to *Diplodina Leguminis-Cytisi* (Desm.) v. H. *Ascochyta Laburni* Sacc. and *Diplodina Laburni* Brun. are probably only forms of *D. Leguminis-Cytisi* (Desm.) v. H. As

far as known all species of *Diplodina* are conidial stages of *Didymella*, and as a member of this ascomycetous genus is sparsely present in the type-specimen the fungus is called *Didymella Leguminis-Cytisi* v. H. *Botryella nitidula* Sydow is a *Darluc*a parasitic on a *Puccinia*. The *Puccinia* is a new species and is named *P. aculeatispora* v. H. *Sphaeria perforans* Roberge should be known as *Tiarospora perforans* (Roberge) v. H. This fungus is always accompanied by *Leptosphaeria sabuletorum* (Berk. et Br.) v. H. and is probably its conidial stage; the complete synonymy is given. *Haplosporella longipes* Ellis et Barth. is said to be a typical *Sphaeropsis* [*S. longipes* (E. et B.) v. H.]; it is perhaps only a form of *Sphaeropsis Mori* Berlese. *Pleosphaeropsis Dalbergiae* Diedicke, type of the genus, is shown to be merely a strongly erumpent *Sphaeropsis* which has a tendency toward multi-chambering and fusion of some pycnidia with each other; *Pleosphaeropsis* is dropped. *Coniothyrium olivaceum* Bon. var. *Pini-silvestris* Ferraris 1902 is treated as *Aposphaeriopsis Pini-silvestris* (Ferraris) v. H. *Coniothyrium Cedri* Rolland is possibly identical with it. The genus *Haplosporella* Speg. is a mixture of very different, unrelated forms. The type, *H. chlorostroma* Speg., is the same as *Camarosporium Robiniae* (West) Sacc., differing only in that for the most part the septation of the conidia has not occurred. *C. Robiniae* (West) Sacc., *C. fenestratum* (B. & C.) Sacc., and *C. Pseudoacaciae* Brun. are said to be identical. *Haplosporella Brunaudiana* Passerini is over-mature *Anthostomella Scopariae* H. Fabre. The old perithecia are used as hosts by an *Eriospora*, for which *E. biparasitica* v. H. is suggested. *Haplosporella caespitosa* (B. et Br.) Sacc. is perhaps a conidial form of *Cucurbitaria Hederæ* Winter. *Haplosporella dothideoides* Sacc. is an over-mature member of the Phyllachoraceae, *Phaeochora Chamaeropsis* (Cooke) v. H. *Haplosporella minor* Ell. and Bartholomew is probably the conidial form of an unknown *Cucurbitula*, and *Sclerothyrium minor* (Ell. and B.) v. H. is suggested as its name. *Haplosporella missouriensis* Bubák is considered a *Dothiorella* with colored conidia. *Haplosporella Rhamni* Diedicke is called *Sclerothyrium Rhamni* (D.) v. H. *Coniothyrium insitivum* Sacc. is said to be a mixed species and in part is referred to a species of *Sclerothyrium*. *Haplosporella dendritica* Raciborski is probably a *Lasmenia* with a well-developed stromatic tissue. Certain species of *Haplosporella* are said to have demonstrable conidiophores; a new genus, *Microsporella*, is created for these. *M. pityophila* v. H. is the conidial stage of *Cucurbitaria pityophila* (K. and S.) de Not. *Stenocarpella Zeae* Sydow should be called either *Macrodiplodia macrospora* (Earle) v. H. or *Diplodia Zeae* (Schw.) Lévl. var. *macrospora* (Earle) v. H. Ten different forms of *Septoria* described on the leaves of species of *Convolvulus* are discussed. They are said to represent but 2 different species, *Septoria Convolvuli* Desm. and *Hendersonia Calystegiae* (Westendorp) v. H.; a complete synonymy is given. *Taeniophora acerina* Karsten is transferred to the Sphaerioidae-astomae from the Exicipulaceae. *Sphaeronaemella* Karsten was based on a *Ceratostomella*-like ascomycete. *Sphaeria vitrea* Corda is made the basis of a new genus of the Nectrioidaceae called *Hyalopycnis*; some related species of *Hyalopycnis* are perhaps conidial stages of *Hypomyces*. The new genus *Mycorhynchella* (Nectrioidae) is described. It differs from *Mycorhynchus* Sacc. in the micro-plectenchymatous structure of the pycnidia and in the conidia. A new genus, *Cyanophomella* v. H. (Nectrioidae-ostiolatae) is based on *Phoma acervalis* Sacc. *Botryogene* Sydow is identical with *Stagonostroma* Diedicke and *Botryogene visci* Sydow becomes *Stagonostroma visci* (Syd.) v. H. It is considered a pycnidial stage of a *Gibberella*. The nomenclatorial tangle existing in connection with the generic names *Chaetostroma* and *Amerosporium* is discussed and several new binomials are proposed. *Chaetodiscula hysteriformis* Bubák et Kabát is identical with *Myrothecium typhae* Fuckel, and *Chaetodiscula* Bub. et Kab. is identical with *Myxormia* Berk. et Br. The genera *Dinemasporium* Lévl., *Pseudolachnea* Ranojevic, and *Dinemasporiopsis* Bub. et Kab. are identical. A new genus, *Bactrexipula*, is created and referred to the Patelloidaceae-Excipulatae. The synonymy of *Psilidosperma mirabile* Sydow is given. It probably represents a new genus, *Eriosporella* v. H., of the Melanconiaceae. The description of *Hainesia* Ellis et Sacc. is amplified. *Dacryomyces Lythri* Desmazières is a *Hainesia* and is called *H. Lythri* (Desm.) v. H. *H. tremellina* Sacc. is a typical *Hainesia*. *H. Rubi* (Westendorp) Sacc. is not a *Hainesia* and is provisionally designated as *Leptosporium Rubi* (West.) v. H. *Hainesia Feurichii* Bubák probably belongs to *Pseudopeziza*. *Hainesia taphrinoides* D. Sacc. et Cavara is to be cancelled. *Phyllosticta destructiva* Desm. is said to



be a mixed species. The variety *Malvarum* upon the leaves of *Malva sylvestris* and *M. rotundifolia* is taken as the type; it is identical with *Ascochyta destructiva* (Desm.) v. H. upon *Malva* and should bear the latter name. The variety *b Lycii* should be known as *Ascochyta Lycii* (Desm.) v. H. A new genus, *Stictopatella* v. H., is based on *Phyllosticta destructiva* var. *c Evonymi* Desm. The type species is *Stictopatella Evonymi* (Desm.) v. H. The various species of *Phyllosticta* described upon *Hedera* are the same. *Apiosporium Fumago* Fuckel is called *Diplopetitis Fumago* (Fckl.) v. H. *Peltaster Hedyotidis* Sydow is said not to be related to *Eriothyrium dubiosum* Speg.; it is a conidial stage of one of the Coccodiniaceae. *E. fuegianum* Speg. belongs to the Pycnothyriaceae. An amended description is given for the genus *Asteromella* Pass. et Thüm. *Sacidium alpestre* Cesati is said to be hardly distinguishable from *Leptothyrium vulgare* (F.) but is called *L. alpestre* (Ces.) v. H. The conidial stage of *Euryachora betulina* (Fr.) Schröter is a member of a new genus of the Leptostomaceae, here named and described as *Didymochora* v. H. The genus *Dothiorella* Sacc. is a composite genus; many transfers to other genera are made and discussed. A description of the new genus *Sclerothyrium* v. H. is given followed by the complete synonymy. The type is *S. Tamarisci* (Mont.) v. H. *Sphaeropsis conglobata* Sacc. is said to be a typical *Hendersonula* Speg. and therefore must be called *H. conglobata* (Sacc.) v. H. It is probably the conidial stage of *Dothidea virgultorum* (Fr.) Wint. *Sphaeria oreades* Fries is merely a differently developed leaf-inhabiting form of *Dichomera Saubinetii* (Mont.) Cooke, as a variety of which it is named *oreades* (Fr.) v. H. The characterization of the genus *Dichomera* Cooke-Sacc. is amended and a new genus, *Pseudodichomera* v. H., is erected for *Dichomera varia* (Pers. ?) Diedicke, which is doubtless the conidial stage of *Cucurbitaria bicolor* Fuckel. *Dichomera Elaeagni* Karsten is given as *Pseudodichomera Elaeagni* (K.) v. H.; *Camarosporium Elaeagni* Potebnia is identical. *Dichomera Laburni* Cooke et Massee and the different species of *Camarosporium* which have been described on *Cytisus* are placed in *Pseudodichomera*. *Dichomera Tiliae* (Therry) Sacc., *D. sphaerosperma* (B. et C.) Sacc., and *D. stromatica* (Preuss.) Sacc. are genuine *Dichomeras*. *Dichomera mutabilis* Berk. et Broome is perhaps *Cucurbitaria Platani* Tavel. *Dichomera mutabilis* is a *Pseudodichomera*. On 1 specimen of *Dichomera mutabilis* occurred an undescribed *Botryodiplodia* which v. Höhnelt names *B. corylicola*. The genus *Pseudostegia* Bubák is based upon *P. nubilosa* (Ell. et Ev.) Bubák, which is identical with *Cryptosporium atrum* Kunze. *Cryptosporium* Kunze and *Cryptosporium* Sacc. are, notwithstanding the fact that they both possess hyaline conidia, different from one another. *C. atrum* Kze. is closely related to *Pilidium* Kunze (not Sacc.) and *Harposporella* v. H. An amended description of *Cryptosporium* Kunze (not Sacc.) is given. The genus *Placosphaeria* Sacc. (not deNotaris) is discussed. It is understood to contain only the characteristic forms of the conidial stage of typical species of *Euryachora* Fuckel; 12 species are critically considered. *Coniothyrium concentricum* (Desm.) Sacc. is given as *Dothisphaeropsis concentrica* (D.) v. H. *Coniothyrium Agaves* (Mont.) Sacc. is very similarly constructed and a comparison of the 2 fungi must show whether it is a question of form of growth of the same fungus due to external stimuli or whether it is a different fungus. *Readeriella mirabilis* Sydow may be related to *Dothisphaeropsis*. *Phoma jasminicolum* Desmazières is shown to be a *Stictochorella* v. H., and is called *S. jasminicola* (Desm.) v. H. *Stictochorella Juniperi* v. H. n. sp. is probably a conidial stage of a species of *Carlina* (Phyllachoraceae). The genus *Leptostromella* Sacc. was erected by Saccardo and Roumeguère as a section of *Leptostroma*. It contained to a certain extent *Leptostroma* with elongate conidia. However, the 2 genera are entirely distinct. The type species, *Leptostromella septorioides* Sacc., is the conidial stage of a *Phyllachora*. *Linochora* v. H., erected for the conidial stages of *Phyllachora* with thread-shaped conidia, is different from *Leptostromella* Sacc. *Leptothyrium Cytisi* Fuckel is shown to be *Leptostromella Cytisi* (Fuck.) v. H.; *Leptostromella Atriplicis* Bubák et Krieger is similar. *Septoria caricinella* Sacc. et Roumeguère is a *Linochora* and is called *L. caricinella* (Sacc. et Roumg.) v. H., and is assumed to be the conidial stage of *Phyllachora caricis*. *Diplodina samaricola* Diedicke is said to have been incorrectly and incompletely described by Diedicke; it represents a separate form genus, which von Höhnelt calls *Septochora*. *Diplodina samaricola* Diedicke should therefore be called *Septochora samaricola* (Died.) v. H. *Peltistromella brasiliensis* v. H. is said to be closely related to *Phragmopeltis* (P. H.) v. H. and *Peltistroma* (P. H.) v. H. but has 2-celled conidia. *Septoria*

*macrospora* Durieu et Montagne is shown to be closely related to *Kellermannia anomala* (Cooke) v. H., but is an independent genus which probably should be called *Piptarthron* Montagne. An amended description is given to the genus *Piptarthron* Montagne. *Ischnostroma Merrillii* Sydow is shown to be a conidial stage of a member of the Polystomellaceae, almost certainly an *Asterodothis* and not the conidial stage of a member of the Trichopeltaceae as previously stated. *Sirosphaera botryosa* Sydow is placed among the Pachystromaceae-Dothideales-Superficiales where it is supposed to be the conidial stage of a member of the Dothideaceae. On the type specimen of *Phoma Ilicis* Desmazières were found 2 fungi, *Phyllosticta ilicicola* C. et Ell., and *Phoma Ilicis*, which is a *Phomopsis* and is called *P. Ilicis* (D.) v. H. *Phoma lirella* Desmazières is a *Phomopsis*, *P. lirella* (D.) v. H., and on the same stem occurs the related *Diaporthe* (*Euporthe*) *Vincae* Cooke. *Phoma subnervisequum* Desmazières is a typical *Phomopsis* which must be called *P. subnervisequia* (Desm.) v. H. Since *Diaporthe Laschii* Nitschke occurs on *Evonymus*, *Phomopsis subnervisequia* probably belongs to it. *Phoma effusum* Roberge must be called *Phomopsis effusa* (Rob.) v. H., and it is probably the conidial stage of *Diaporthe* (*Tetrastaga*) *Therryana* P. et S. *Phoma Hellebori* Br. et Har. 1891 is said to be the same fungus. Only *Diaporthe Phoenixis* Pat. and *D. Chamaeropina* Gaja have been known upon palm leaves. A number of forms described on them as *Phoma* and *Phyllosticta* are certainly species of *Phomopsis*. Thus *Phoma cocoinea* Cooke, *P. palmicola* Winter, *P. Phoenixis* Sacc., *P. Phoenixis* (Ces.) Sacc., and *P. coccophila* Speg. will probably all be reduced to 2 species. *Phomopsis syngenesia* (Brun.) v. H. is said to be the conidial stage of *Diaporthe syngenesia* (Fries). It is also stated that *Phoma syngenesia* P. Brunaud and *P. Frangulae* Oudemans are identical with *Phomopsis syngenesia* (Brun.) v. H. *Pyrenochaetinia obtogens* Sydow shows no bristles; it may for the present be placed in *Sclerophomina* v. H. *Sphaeria Miribelii* Fries should be known as *Sarcophoma Miribelii* (Fries) v. H.; the complete synonymy is given. This fungus is probably the conidial stage of *Naevia pallida* (Fuck.) Rehm. *Phoma nitidum* Roberge in herb. is transferred to the genus *Sclerophoma* as *S. nitida* (Rob.) v. H., although not a typical species. *Sphaeria aliena* Fries is *S. foveolaris* Fries 1823; a complete synonymy is given [see also Hedwigia 59: 270. 1917]. *Phoma punctiformis* Desmazières is referred to the genus *Sclerophoma* as *S. punctiformis* (Desm.) v. H. *Bakerophoma Sacchari* Diedicke, type of the genus, is shown to be worthless and the genus is cancelled.—E. E. Honey.

1525. JOHNSTONE, JAS. Fungoid infection of plaice. Proc. and Trans. Liverpool Biol. Soc. 34: 120-121. Fig. 1-2. 1920.—Two plaice that had died in the spawning pond were found to have their liver, spleen, kidneys, and peritoneum containing small whitish nodules 1-2 mm. in diameter. The nodules were found to consist of a fungus body, composed of mycelium and sporangium-like bodies.—Charles Drechsler.

1526. KAUFFMAN, C. H. Isoachlya, a new genus of the Saprolegniaceae. Amer. Jour. Bot. 8: 231-237. 2 pl. 1921.—This new genus is established to include 3 species: *I. toruloides*, a new species here described under the joint authorship of KAUFFMAN and COKER; *I. paradoxa* (Coker) comb. nov., and *I. monilifera* (de Bary) comb. nov. These are all characterized by the presence of the cymose *Achyla* mode of formation of secondary sporangia, coupled with diplanetic zoospores. *I. toruloides* was studied in detail and the morphological and physiological differences resulting from cultivation on various substrata are recorded.—E. W. Sinnott.

1527. MARCHAL, EL., ET EM. [MARCHAL]. Contribution a l'étude des champignons fructicoles de Belgique. [Contribution to the study of the fruit-inhabiting fungi of Belgium.] Bull. Soc. Roy. Bot. Belgique 54: 109-139. 1921.—The author identifies 67 species, of which 24 are species or varieties new to science. The investigations have been carried out for 6 years on fleshy fruits, especially on the stone-fruits. Frequent resort to pure cultures from mycelium was made. Besides forms already known, descriptions of the following new species are given: *Pleospora Lycopersici*, *Diaporthe perniciosa*, *Dothiorella vinosa*, *D. Mali* Karst. var. *globuligera*, *Fuckelia conspicua*, *F. Malorum* Oud. var. *macrosporium*, *F. rimosum*, *Cytosporella fructorum*, *Hendersonia vagans* Fuck. var. *fructicola*, *Oospora umbrina*, *Hyalopus pruinosis*,



*Penicillium flavum*, *P. olivaceum* Wehmer var. *discoideum*, *Gliocladium cinereum*, *Ramularia cerasorum*, *Torula lamelligera*, *Alternaria tenuis* Nees. var. *Mali*, *Tilachlidium nigrescens*, *T. Malorum*, *Isaria felina* Fr. var. *pirina*, *Graphium fructicolum*, *Tubercularia piricola*, *Dendrodochium pulchrum*, *D. versicolor*.—Henri Miceels.

1528. MAYOR, EUG. Contribution à l'étude de la flore mycologique de la région de Chateau-d'OEx. [Contribution to the fungus flora of the Chateau-d'OEx region.] Bull. Soc. Vaudoise Sci. Nat. 52: 395-418. 1919.—The author studied the fungus flora prevailing near Chateau d'OEx during the latter part of the summer and the fall of 1918. It was found to be richer than might have been expected from the meagre attention given to the region in floristic works on Switzerland. An annotated list of the parasitic forms, including, however, only the Peronosporaceae, Ustilaginaceae, Uredineae, Protomycetaceae, and the Erysiphaceae, is given, supplementing a similar one previously issued by the author on the fungus flora in the vicinity of Leysin, the 2 constituting an account of the parasitic fungi thriving in the Vaudoise Alps. In the present list, the Uredineae, represented by 142 species, and the Erysiphaceae, represented by 17 species, easily predominate, a fact partly attributable to the season of the year during which the collections were made. Of the Peronosporales 10 species are mentioned, and of the Ustilaginales 9 species. *Protomyces macrosporus* Unger, *P. Kreuthensis* Kühn, and *P. Leucanthemi* Magnus represent the Protomycetaceae.—Charles Drechsler.

1529. MURRILL, WILLIAM A. Light-colored resupinate polypores - IV. Mycologia 13: 171-178. 1921.—Descriptions are given of 16 species of yellow Porias, including the following new species: *P. ochracea*, *P. flavida*, *P. Calkinsii*, *P. Parksii*, *P. subradiculosa*, *P. flavilutea*, and *P. jalapensis*.—H. R. Rosen.

1530. PETCH, T. Hypocreaceae Zeylanicae. Ann. Roy. Bot. Gard. Peradeniya 7: 85-138. 1920.—This paper consists of 2 parts, the 1st consisting largely of critical notes on Berkeley and Broome's types, the 2nd a systematic list. Eighty-one species in 2 genera are enumerated from Ceylon. The following are described as new: *Nectria discoidea*, *N. bomba*, *N. albofulta*, *N. sulcispora*, *Bresadoella nigra*, *Hypocrea gigantea*, *H. brunnea*, *H. extensa*, *H. chlorostroma*, *H. mellea*, *Hypomyces pallidus*, *Calonectria oodes*, *Gibberella rugosa*, and *Micronectria eugeniae*.—E. D. Merrill.

1531. PETHYBRIDGE, GEO. H. Sexual organs of Phytophthora. Nature 107: 204. 1921.—It was reported in Nature (93: 226. 1914) that in *P. erythroseptica* and *P. infestans* the oogonial incept penetrates the antheridium at an early stage, traverses it, emerges, and then swells to form the oogonium proper. This type of sexuality occurs also in other species. One on decaying apples has been found occasionally to show this phenomenon; also normal lateral fusion of sex organs on the same individual. Occasional occurrence of the oogonial penetration should be looked for in species of the *cactorum* or *omnivora* group. Exchange of material is desired by the author.—O. A. Stevens.

1532. SCHNEIDER, ALBERT. "California bees." Druggists Circ. 65: 10, 16-17. 1921.—An account is presented of a little known ferment, some of its uses, and commercial possibilities of growing it.—C. M. Sterling.

1533. SHEAR, C. L., and B. O. DODGE. The life-history and identity of "*Patellina fragariae*," "*Leptothyrium macrothecium*," and "*Peziza oenotherae*." Mycologia 13: 135-170. Pl. 8-10, fig. 1-5. 1921.—The authors present "an account of the life-history, morphology and taxonomy of a discomycete, *Pezizella lythri* (Desm.) Shear & Dodge, (comb. nov.) which is found on a great variety of plants, and has three stages in its life-cycle: sporodochia, pycnidia, and apothecia." The conidial stage belongs to the form genus *Hainesia*, the pycnidial is *Sclerotiopsis concava* (Desm.) Shear & Dodge comb. nov., and the ascleigerous stage belongs to *Pezizella*. "Cross inoculation experiments show that the fungus is a weak parasite and passes readily under favorable conditions from one host to another." About 50 hosts are listed, including species of *Acer*, *Ampelopsis*, *Castanea*, *Cercis*, *Cornus*, *Duchesnia*, *Epilob-*

*ium*, *Eucalyptus*, *Fragaria*, *Gaultheria*, *Gaura*, *Hicoria*, *Jambosa*, *Lythrum*, *Nyssa*, *Oenothera*, *Vaccinium*, *Pelargonium*, *Populus*, *Potentilla*, *Prunus*, *Quercus*, *Rhus*, *Ribes*, *Rosa*, *Rubus*, *Salix*, *Smilax*, *Ulmus*, and *Vitis*.—H. R. Rosen.

1534. STONE, R. E. Deadly poisonous mushrooms. Canadian Field Nat. 34: 74-78. Fig. 1-4. 1920.—Five of the most poisonous mushrooms growing in the woods of Ontario are carefully described. The rules often applied to the gathering of mushrooms are included.—W. H. Emig.

1535. ZUNDEL, GEORGE L. Smuts and rusts of northern Utah and southern Idaho. Mycologia 13: 179-183. 1921.—Nine smuts and 25 rusts are listed, together with hosts and localities in which collections were made.—H. R. Rosen.

## LICHENS

1536. ANONYMOUS. A rare lichen. Proc. Linn. Soc. New South Wales 45: 265. 1920.—A note is recorded on a lichen collected on Mount Kosciusko by Miss A. V. Duthie. One specimen collected in 1890 by Rev. F. R. M. Wilson is labelled *Dufourea madreporiformis* (Wulf.) Ach. It seems to have close affinities with *Dactylina artica* (Hook) Nyl. No apothecia are present.—Eloise Gerry.

1537. SAMPAIO, GONCALO. Novas contribuições para o estudo dos liquenes portugueses. [New contributions to the study of Portuguese lichens.] Broteria Ser. Bot. 19: 12-35. 1921.—This is a list of 74 species of lichens, mostly new to the flora of Portugal. Brief characterizations accompany each species mentioned and there is careful citation of localities. New combinations occur in *Bacidia*, *Buellia*, *Catillaria*, *Lecania*, *Lecanora*, *Lopadium*, and *Solenospora*.—*Lecanora gerezina* Samp. (nom. nov.) is proposed for *L. tristis* Samp. (non Merezk).—*Acarospora Zahlbrueckneri* Samp. and *Lecanora lisbonensis* Samp. are proposed as new.—E. B. Chamberlain.

1538. WAINIO, E. A. Lichens ab A. Yasuda in Japonica collecti. (Continuatio I.) [Lichens collected in Japan by A. Yasuda.] Bot. Mag. Tôkyô 35: 45-62, 63-79. 1921.

## BACTERIA

1539. KUFFERATH, H. Bacterium Puttemansi Kufferath nov. sp. Microbe produisant des tacher sur la tomate (*Lycopersicum esculentum*) conservée. [Bacterium Puttemansi Kufferath n. sp., cause of spotting of canned tomatoes.] Bul. Soc. Roy. Bot. Belgique 54: 190-194. 1921.—The spots appear in the form of small yellowish pustules resembling the pimples of human boils. The mycological features of the cultures and the inoculations are given. This is the first time that an organism causing lactic fermentation has been found causing lesions on preserved vegetables.—Henri Micheels.

1540. SCHNEIDER, ALBERT. Bacteriology from the physico-astronomical viewpoint. Pacific Pharm. 12: 107-114. 1918.

## MYXOMYCETES

1541. MEYLAN, CH. Notes sur quelques espèces de Myxomycetes. [Notes on several species of Myxomycetes.] Bull. Soc. Vaudoise Sci. Nat. 52: 447-450. 1919.—The author made a study of 3 forms derived from Persoon's original *Trichia botrytis*: (1) *T. botrytis* Pers. gen., (2) *T. lateritia* Lev., and (3) *T. subfusca*, the latter 2 being regarded by some authors as varieties of the first, and by others as independent species. He concludes that 3 good species are here represented, and defines the specific differences. *T. lateritia* alone always bears the sporangia aggregated in groups of 4-10, and apparently served as type for Persoon's *T. botrytis*. *T. subfusca* is distinguished from the other 2 by a marked difference in color of plasmodium.—A new species of *Hemitrichia* is proposed, *H. obrussea*; a new species of *Lamproderma*, *L.*



*Gulielmae*, dedicated to Miss Lister, is described, differing from *L. violaceum* in possessing smaller sporangia and larger spores. The genus *Diderma* is enriched by the addition of 2 new varieties, — *D. simplex* Schroet var. *echinulatum* var. nov. and *D. montanum* var. *roseum* var. nov.—Charles Drechsler.

## PALEOBOTANY AND EVOLUTIONARY HISTORY

EDWARD W. BERRY, *Editor*

(See in this issue Entries 1374, 1497)

## PATHOLOGY

G. H. COONS, *Editor*

C. W. BENNETT, *Assistant Editor*

(See also in this issue Entries 1143, 1147, 1266, 1419, 1421, 1435, 1471, 1498, 1517, 1617, 1641, 1642)

## PLANT DISEASE SURVEY (REPORTS OF DISEASE OCCURRENCE AND SEVERITY)

1542. ANONYMOUS. Mosaic or mottling disease of sugar-cane. Agric. News [Barbados] 19:345. 1920.—A communication to the local press from the Director of Agriculture, Barbados, is noted announcing the presence of the disease in that Colony. Canes found in St. Lucia and thought to be affected, proved on closer examination to be free from the disease though presenting a similar appearance.—*J. S. Dash.*

1543. HOWARD, W. L. An old disease in a new place. Proc. Amer. Soc. Hort. Sci. 17: 102-104. 1920 [1921].—Due to the fact that the regions of California in which stone fruits are grown are sections without summer rains, brown rot (*Sclerotinia cinerea*) was practically unknown. During the past 5 years considerable damage has been done but almost exclusively in the cool, moist region along the coast or in the vicinity of San Francisco Bay. The disease does most damage where frost injury is likely to occur. The atmosphere is quite humid in this region but why the fungus seems to have become adapted to spots where low temperature prevails around blooming time, rather than in warm places, is not clear. It was found that the disease could be controlled on apricots to within 4 or 5 per cent by a single application of either lime-sulphur (1 to 10), dry lime-sulphur (12 pounds to 50 gallons), or Bordeaux mixture (4-5-50), when the trees were sprayed after the fruit buds were noticeably swollen. Spraying after the trees are passing out of bloom does very little good, and spraying before the buds swell is equally unprofitable. Apparently the disease attacks the trees when they are in full bloom. Crude oil emulsion, which is commonly used in winter against brown apricot scale, gives promise of being an effective remedy where spraying is done after the buds begin to swell. A distillate emulsion, lime whitewash, and dry sulphur each have failed to control. Self-boiled lime-sulphur applied when the apricots were half grown had no effect upon the disease but completely checked the development of the fruit. Brown rot is not a serious problem with the ripe fruit, apparently because of the dryness of the air at the ripening period. The disease also attacks peach and plum but usually not seriously; in one locality it became serious on peaches at ripening time.—*H. W. Richey.*

1544. LEE, H. A., AND F. B. SERRANO. Banana wilt in the Philippines. Philippine Agric. Rev. 13: 128-129. 1920.—This disease, caused by *Fusarium* sp., is recorded from the Philippines, but the authors note that a number of local varieties of the banana are resistant or immune.—*E. D. Merrill.*

1545. LEE, H. A., AND H. S. YATES. The distribution of pink disease. Philippine Agric. Rev. 13: 115-116. 1920.—A short note is presented indicating that this disease of citrus hosts, caused by *Corticium salmonicolor*, was introduced into the Philippines earlier than the authors formerly supposed.—*E. D. Merrill.*

1546. MASSEY, L. M. Experimental data on losses due to crown canker of rose. *Phytopathology* 11: 125-134. 1921.—Ophelia roses were grown under glass in infested and non-infested soil during a period of 3 years. A record was kept of the plants showing infection and of the number of blossoms produced. Plants becoming infected with the canker fungus (*Cylindrocladium scoparium*) were not killed outright, but were weakened and produced fewer blossoms than healthy plants. In this experiment the average decrease was about 10 blossoms per plant.—B. B. Higgins.

1547. NEGER, F. W. Die Krankheiten unserer Waldbäume und wichtigsten Gartengeholze. [The diseases of our forest trees and most important garden shrubs.] viii + 286 p., 234 fig. Ferdinand Enke: Stuttgart, 1919.—After a short introduction the author presents his material in 2 main divisions. The 1st part treats diseases resulting from frost, heat, lack of or too much light, disturbance of the water balance, lack of or too much nutrient, poisonous gases, smoke, atmospheric disturbances such as wind, snow, lightning, etc., and mechanical injuries. The 2nd part opens with a general discussion of immunity, susceptibility, infection, host reaction, and control of parasitic diseases, and then takes up bacterial diseases, fungous diseases, and the injuries caused by lichens and parasitic phanerogams. The data on any particular disease are presented from the symptomatic standpoint, but short keys on the mycological differences of the parasitic species within a given genus are inserted whenever necessary. Footnote references to pertinent literature, in many cases accompanied by abstracts of the results obtained by the investigators cited, are used frequently. At the end of the book concise symptomatic descriptions of the diseases discussed in the text are given under the name of the host.—Reginald H. Colley.

1548. WOLF, F. A., AND S. G. LEHMAN. Notes on new or little known plant diseases in North Carolina in 1920. *Ann. Rept. North Carolina Agric. Exp. Sta.* 43: 55-58. 1920 [1921].—The authors mention *Phoma corvina* on cotton following injury by lightning, and a root mold, *Penicillium spiculisporum*, described in *Mycologia* 12: 168-174. 1920; pod rot of cowpeas caused by *Choanephora cucurbitarum*; pod blight (*Diaporthe phaseolarum*) of lima beans; fig anthracnose (*Glomerella cingulata*); soft rot of peppers (*Pythium de Baryanum*); mosaic, anthracnose (*Glomerella cingulata*), and *Phoma* blight (*Phoma* sp.) of soy bean; buckeye rot (*Phytophthora terrestris*) of tomato; and downy mildew (*Peronospora viciae*) of vetch.—F. A. Wolf.

### THE HOST (RESISTANCE, SUSCEPTIBILITY, MORBID ANATOMY AND PHYSIOLOGY)

1549. ADAMS, J. F. Observations on wheat scab in Pennsylvania and its pathological histology. *Phytopathology* 11: 115-124. *Pl.* 2-3, *fig.* 1. 1921.—Under Pennsylvania conditions wheat (*Triticum sativum*) seedling infection by *Gibberella saubineti* is comparatively unimportant. Head infection is much more prevalent, occurring in all the wheat-growing centers of the state. The majority of infections occur when the kernels are in the "milk" stage and injury is usually confined to 1 or 2 spikelets of a head. The kernels in such spikelets are conspicuously shriveled. The fungous mycelium apparently enters through the germinal end of the seed; and from this point, it spreads throughout the interior. The endosperm usually fails to develop. The embryo is entirely disorganized and replaced by a mass of intertwining mycelium. Apparently the mycelium does not spread through the rachis from one spikelet to another. In heads artificially inoculated during the flowering stage, the ovules failed to develop.—B. B. Higgins.

1550. ANDERSON, H. W. Some factors influencing the practical control of blister canker in apple orchards. *Proc. Amer. Soc. Hort. Sci.* 17: 111-116. 1920 [1921].—This is a report of investigations in Illinois orchards. The important factors in the etiology of the fungus are source and manner of infection and the life of the fungus in the host. The sources of infection are ascospores, conidia, and mycelium. Due to "(1) their immunity from injury by ordinary weather conditions, (2) their long vitality, (3) their ability to infect readily when



on the proper pabulum, (4) their great abundance, and (5) the provisions for their wide dissemination," the ascospores are the main source of infection. The conidia are produced in enormous numbers and may appear the first or any subsequent season. They are quickly killed by drying and probably cause but little infection, for repeated failures have resulted from attempts to cause infection under natural conditions. The mycelium is capable of causing infection but it is probable that such infections are rare. The manner of infection is influenced by disseminating agents such as water, wind, insects, pruning tools, etc.; by the opportunity for infection such as is occasioned by the presence of large wounds on older wood; and by the physical conditions such as age and vigor of tree and weather conditions, the canker being more prevalent on older trees and during dry seasons. The mycelium grows rapidly in the dry wood and may extend several feet from the apparent canker.—In Illinois the chief varieties injured are Ben Davis, Gano, Chenango, and Willow Twig. The author thinks that with the elimination of Ben Davis there would be but little trouble from the disease. Wild hosts, especially the mountain ash, should also be destroyed.—The author gives a plan for the practical control of blister canker which includes avoiding susceptible varieties, removing diseased young trees, and disinfecting and carefully pruning all diseased trees in order to destroy all ascospores.—*H. W. Richey.*

1551. CHEMIN, E. Action d'un champignon parasite sur *Dilsea edulis* Stackhouse. [Effect of a fungus parasitic on *Dilsea edulis*.] Compt. Rend. Acad. Sci. Paris 172: 614-617. 1921.—A description is given of the effect of parasitic fungi upon the plants of this red alga. The author discusses the parasitism and symbiosis of fungi living in association with algae.—*C. H. Farr.*

1552. McLEAN, FORMAN T. A study of the structure of the stomata of two species of *Citrus* in relation to citrus canker. Bull. Torrey Bot. Club 48: 101-106. 1 fig. 1921.—Stomata of Szinkum mandarin, which is resistant to Citrus canker (*Pseudomonas citri*), and of Florida seedling grapefruit, which is susceptible, are compared and those of the resistant form are found to have a broad ridge of entrance overarching the outer chamber. Such an arrangement practically excludes water from the stomata of the mandarin and accounts for resistance to canker bacteria.—*P. A. Munz.*

1553. McLEAN, FORMAN T., AND H. ATHERTON LEE. The resistance to citrus canker of *Citrus nobilis* and a suggestion as to the production of resistant varieties in other citrus species. Phytopathology 11: 109-114a. Fig. 1. 1921.—The horticultural varieties of the Mandarin orange (*Citrus nobilis* var. *deliciosa*) have been mentioned by various writers as truly resistant to canker (*Pseudomonas citri*). The fact that a few scattered cankers frequently occur on trees of these varieties led to an investigation of the resistance of the latter. Inoculation with pure cultures of *Pseudomonas citri* were made upon wounded and unwounded leaves of three varieties of this group. The inoculation of wounded leaves gave a percentage of infection fully as high as with the more susceptible species of *Citrus*; while with the unwounded leaves only a few cankers developed, evidently at insect or other punctures. The results indicate that the resistance is due to the nature of the epidermis (see preceding entry). The utilization of graft hybrids, to transfer the Mandarin epidermis and resistance to other more susceptible varieties without changing the quality of the fruit, is suggested.—*B. B. Higgins.*

### DESCRIPTIVE PLANT PATHOLOGY

1554. BIJL, PAUL A. VAN DER. On a fungus, *Ovulariopsis Papayae* n. sp., which causes powdery mildew on the leaves of the pawpaw plant (*Carica Papaya* L.). Trans. Roy. Soc. South Africa 9: 187-189. Pl. 10, 1 fig. 1921.—A description is given of the fungus which is thought to be the conidial stage of a *Phyllactinia*.—*E. M. Doidge.*

1555. CARPENTER, C. W. Report of the Division of Plant Pathology. Hawaii Agric. Exp. Sta. Rept. 1919: 49-54. Pl. 7-8. 1920.—Discussion of taro rot (probably *Pythium deBaryanum*), taro stem rot (*Sclerotium rolfsii*), and of the control of banana freckle disease

(*Phoma musae*) with Bordeaux mixture plus a resin-salsoda sticker is given. An annotated list of diseases affecting taro, peanuts, figs, bananas, and grape vines is included.—*J. M. Westgate*.

1556. ELLIOTT, JOHN A. A mosaic of sweet and red clovers. *Phytopathology* 11: 146-148. *Fig. 1*. 1921.—A mosaic disease was found occurring naturally on plants of red clover (*Trifolium pratense*) and sweet clover (*Melilotus alba*). Cross inoculations proved that the disease could be easily transferred from one species to the other and from both to plants of *Vicia faba* and *Medicago arabica*. All attempts to inoculate plants of *Medicago sativa* and *Trifolium repens* failed.—*B. B. Higgins*.

1557. ENSLOW, ELLA M. A., AND FREDERICK V. RAND. A lotus leafspot caused by *Alternaria nelumbii* sp. nov. *Phytopathology* 11: 135-140. *Pl. 4, fig. 1*. 1921.—A leaf-spot of Egyptian lotus (*Nelumbium speciosum*) is ascribed to *Alternaria nelumbii* n. sp. The spots appear first as small, smooth, reddish-brown flecks which later enlarge to a diameter of 5-10 mm. and tend to develop concentric light and darker markings. The above named fungus was isolated from these spots and its pathogenicity proved.—*B. B. Higgins*.

1558. EYER, J. R. The influence of leaf hopper control on potato yields. *Jour. Econ. Entomol.* 14: 69-71. 1921.—The author reports experimental work with Bordeaux mixtures, Bordeaux-nicotine, lime-nicotine, and nicotine-soap for the reduction of burning caused by leaf hopper (*Empoasca mali*) and to determine the effect of these control measures upon yield. Bordeaux (4-4-50) gave the best practical control. One set of plots was sprayed by hand and another by machine; the results were decidedly in favor of machine spraying, both from the standpoint of hopper-burn control and from the standpoint of yield.—*A. B. Massey*.

1559. FABRICIUS. [Rev. of: GRÄBNER, PAUL. *Lehrbuch der nichtparasitären Pflanzenkrankheiten*. (Textbook of non-parasitic plant diseases.) 333 p., 244 fig. Paul Parey: Berlin, 1920.] *Forstwiss. Centralbl.* 43: 184-185. 1921.—This book corresponds, in the field of non-parasitic diseases, to VON TUBEUF'S work on parasitic plant diseases. Forestry, while more or less helpless against parasitic diseases, can usually combat the others by means of silvicultural measures. Gräbner discusses the diseases under the following heads: Diseases due to (1) unfavorable soil conditions; (2) humidity and wind movement; (3) heat and light; (4) wounds; (5) noxious gases and liquids; (6) enzymes.—*W. N. Sparhawk*.

1560. FENTON, F. A. Progress report on the season's work on the production of potato tipburn. *Jour. Econ. Entomol.* 14: 71-83. 1921.—Studies and observations are reported on the nature of tipburn and habits of the insect which causes it. Tipburn was produced by the leaf hopper (*Empoasca mali*) to the same extent and equally rapidly under diverse environmental conditions of the host plants, such as soil type, soil moisture, humidity, and presence or absence of sunlight. The injury is local, not systemic, and is in itself the greatest factor in inducing burning. Severity of tipburn in fields is correlated with leaf-hopper population and not with sunlight, maximum temperature, or minimum humidity. Other potato insects are not concerned with tipburn. Mechanical injury such as needle punctures in veins gave no definite results. Complete severing of a midrib induced burning of leaflets in 19 days. Bordeaux mixture prevents tipburn by repelling ovipositing females.—*J. E. Kotila*.

1561. MÜLLER, B. Das Tannensterben im Frankenwalde. [Dying firs in the Frankenwald.] *Forstwiss. Centralbl.* 43: 121-130. 1921.—A discussion of the cause of extensive dying out of firs in the Frankenwald, with a criticism of some of SCHEIDTER'S conclusions as to the causes, and remedies are given. Death appears to be due to an epidemic of the "Hallimasch" (*Agaricus melleus*), which is normally a saprophyte, but becomes parasitic under certain conditions, especially a prolonged drought. While Müller questions whether the methods of silvicultural management recommended by Scheidter will eliminate the disease, he suggests a number of points that need careful investigation.—*W. N. Sparhawk*.



1562. TAUBENHAUS, J. J., AND FREDERICK W. MALLEY. Pink root disease of onions and its control in Texas. Texas Agric. Exp. Sta. Bull. 273. 42 p., 3 fig. 1921.—The disease is widespread, being found in California, Iowa, Wisconsin, New York, and Bermuda Islands, as well as in Texas. It is suggested that the disease was probably introduced from Bermuda in shipments of dry sets. The cause of the disease is shown to be *Fusarium mali*. All varieties of onions tested except the Extra Early Red showed a high degree of susceptibility. Narcissus, tulip, freesia, lilies, etc., are not subject to pink root.—It seems probable that other associated organisms increase the virulence of the pathogene. Methods of control, such as crop rotation, fertilizers, and soil sterilization, are discussed.—L. Pace.

1563. VERMOESEN, M. Note sur la maladie du "coup de soleil" des cacaoyers du Mayumbe. [Note on the "sun stroke" disease of cacao trees in Mayumbe.] Bull. Agric. Congo Belge 11:2-21. Fig. 1-41. 1920.—The "sun stroke" disease attacks principally the trunks of cacao trees. A parasitic fungus, *Diplodia theobromae*, develops on the affected trunk, blocks the conducting vessels, and leads rapidly to the death of the tree. The *Diplodia* attacking cacao trees in Mayumbe, W. Africa, is the same species to which is attributed "dieback" of cacao trees, *Hevea* spp., and also the "brown rot" of cacao beans in various tropical countries. The *Diplodia* probably attacks trees of low vitality; it enters the trunk through wounds and acts so rapidly that trees which have formed fruits at the beginning of January are dead toward the end of February. Distribution is affected by wind, birds, insects, and rain. In dealing with this disease 2 factors must be considered; the primary or determining cause, which is still unknown, and the secondary cause, which is the *Diplodia*. Various theories have been advanced as to primary cause; planters attribute it to sun-scald, but this theory is not tenable. Certain other possibilities are discussed, particularly injury caused by borers and other insects, the damage done by termites, and the possible presence of another fungus hitherto undetected. Precautions recommended comprise general sanitary measures, the choice of suitable varieties, and attention to soil drainage.—E. M. Doidge.

1564. VINCENS, F. Parasitisme du Schizophyllum commune Fries sur la canne à sucre. [Parasitism of Schizophyllum commune on sugar cane.] Bull. Agric. Inst. Sci. Saigon 3: 65-68. Pl. 2. 1921.—The author verifies the findings of others that this fungus, although normally a saprophyte, occurs as a parasite on sugar cane.—E. D. Merrill.

1565. WEIR, JAMES R. Thelephora terrestris, T. fimbriata, and T. caryophyllea on forest tree seedlings. Phytopathology 11: 141-144. Pl. 5. 1921.—*Thelephora terrestris* has been found enveloping forest tree seedlings in nursery plantings and in the forests of various localities. The fungus closely envelops and smothers the young plants; but the mycelium does not penetrate the living tissue.—*T. fimbriata* and *T. caryophyllea* were also found enveloping seedlings of various conifers in nurseries and in the forests. Neither of the latter species has previously been reported on coniferous seedlings.—B. B. Higgins.

1566. WOLF, FREDERICK A. Report of the Division of Plant Pathology and Bacteriology. Ann. Rept. North Carolina Agric. Exp. Sta. 43: 53-55. 1920 [1921].—The author presents a concise statement of investigations with tobacco wildfire, soybean leafspot, velvet bean leafspot, false anthracnose of vetch, crop injury by borax, flagellation of legume-nodule bacteria, and tests with varieties of wheat resistant to leaf rust.—F. A. Wolf.

#### ERADICATION AND CONTROL MEASURES

1567. DARNELL-SMITH, G. P. [Rev. of: HURD, ANNIE MAY. Injury to seed wheat resulting from drying after disinfection with formaldehyde. Jour. Agric. Res. 20: 209-244. 6 pl. 1920 (see Bot. Absts. 8, Entry 1375).] Agric. Gaz. New South Wales 32: 323-325. 1921.

1568. FARLEY, ARTHUR J. Results of summer spraying and dusting peaches. Proc. Amer. Pomol. Soc. 35: 175-181. 1917 [1919].—A comparative test on peaches of the value of self-boiled lime-sulphur and hydrated lime-sulphur and glue is recorded. Both materials

gave excellent results in preventing scab (*Cladosporium carpophilum*). In a comparison of dusting and spraying for the control of peach scab, the dust mixture was practically as efficient as self-boiled lime-sulphur in the control of scab.—*E. C. Auchter*.

1569. HUNGERFORD, CHAS. W. A modification of the concentrated formaldehyde method of seed treatment. *Phytopathology* 11: 149-150. 1921.—A formaldehyde solution (1 part formaldehyde to 10 parts of water) is sprayed upon the grain.—*B. B. Higgins*.

1570. REDDICK, DONALD. Status of dusting in orchard protection. *Proc. Amer. Pomol. Soc.* 35: 162-172. 1917 [1919].—An account of the early history of spraying and dusting is recorded. A brief history and description of dusting work done upon other crops and in other states are given. The author concludes that the future possibilities of dusting as a method of orchard protection cannot be predicted at this time.—*E. C. Auchter*.

1571. RIEHM, E. Ein empfehlenswerter Reizapparat. [An excellent steeping apparatus.] *Illus. Landw. Zeitg.* 41: 4. 1 fig. 1921.—A description, with diagram, is given of a very elaborate apparatus for the treatment of seed wheat (1) with water for the separation of many diseased grains, and (2) with formaldehyde as a preventive of stinking smut (*Tilletia* spp.). Provision is also made for the subsequent drying of the seed.—*John W. Roberts*.

1572. THURSTON, H. W., JR. A note on the corrosive sublimate treatment for the control of *Rhizoctonia*. *Phytopathology* 11: 150-151. 1921.—Data are given on the growth from *Rhizoctonia sclerotia* taken from Irish potatoes treated with solutions of corrosive sublimate for various lengths of time.—*B. B. Higgins*.

#### MISCELLANEOUS (COGNATE RESEARCHES, TECHNIQUE, ETC.)

1573. ETTER, BESSIE E. Field cultures of wood-rotting fungi on agars. *Phytopathology* 11: 151-154. 1921.—The equipment needed, the media used and the method of packing it for shipment, and the results from a large number of inoculations are given in detail.—*B. B. Higgins*.

1574. GODFREY, G. H., AND R. B. HARVEY. Motion pictures of zoospore production in *Phytophthora*. *Phytopathology* 11: 145-146. Pl. 6. 1921.

1575. TILLEY, F. W. Phenol coefficients. *Amer. Jour. Public Health* 11: 513-519. 1921.—Phenol coefficients vary with the source of peptone used and with the hydrogen-ion concentration of the culture tested. They also vary with different organisms. The coefficients are determined in the absence of organic matter and so are of little value where the disinfectants are intended for use in its presence. Disinfectants should be tested under conditions simulating as closely as possible those under which they are to be used. It is more important to determine effective concentrations than to determine phenol coefficients.—*C. A. Ludwig*.

1576. VILLEDIEU, G., ET MME. [VILLEDIEU.] De la non-toxicité du cuivre pour le mildiou. [Concerning the non-toxicity of copper for mildew.] *Compt. Rend. Acad. Sci. Paris* 172: 335-336. 1921.—A very delicate test for copper is developed by using 100 cc. of a solution containing 2 drops of potassium ferrocyanide and 4 drops of acetic acid. By this test it is found that copper is not involved in the toxic effect of various solutions applied to fungi.—*C. H. Farr*.

#### PHARMACEUTICAL BOTANY AND PHARMACOGNOSY

HEBER W. YOUNGKEN, *Editor*

E. N. GATHERCOAL, *Assistant Editor*

(See also in this issue Entries 1107, 1113, 1182, 1196, 1197, 1198, 1202, 1205, 1207, 1210, 1211, 1256, 1682)

1577. ANONYMOUS. Jalap production in Mexico. *Pharm. Era* 53: 75-76. 1 fig. 1920.—Temporary cessation in the production of Jalap is due to the earthquake of January 3, which



destroyed whole villages in the state of Vera Cruz where most of the drug is obtained. Jalap is collected, for the most part, from wild-growing plants, but has been cultivated successfully in India and Jamaica. Various other species of *Ipomoea* are used as substitutes for the true Jalap.—*C. M. Sterling.*

1578. ANONYMOUS. Malayan drug venders in the East Indies. Pharm. Era 53: 263-264. 1 fig. 1920.

1579. ANONYMOUS. New botanical drugs sought. Pharm. Era 53: 321-324. 3 fig. 1920.—A staff correspondent account of the H. K. Mulford expedition to South America, conducted by Dr. RUSBY.—*C. M. Sterling.*

1580. ANONYMOUS. U. S. Pharmacopoeial Convention. Druggists Circ. 64: 225-229. 1920.—An account is given of the proceedings of the convention in Washington, D. C., for the 10th decennial revision of the United States Pharmacopoeia, of Dr. WILEY's presidential address, and selection of the committee of revision.—*C. M. Sterling.*

1581. BALLARD, C. W. The identification of gums by the phenyl hydrazine reaction. Amer. Druggist and Pharm. Rec. 68<sup>a</sup>: 28-30. Fig. 1-14. 1920.

1582. BERGER, J. B. "Starch count constants": Their determination and value. Pacific Pharm. 12: 6-9. 1918.—Methods of procedure are given in making quantitative estimates of different starches, and the application of such estimates in food and drug analysis.—*C. M. Sterling.*

1583. BLOKZEYL, K. R. F. The cinchona industry in Java. Pharm. Era 53: 69-73. 5 fig. 1920.—An account is given of the introduction of *Cinchona* into southern Asiatic countries and its cultivation in Java. More than 20 species have been described.—Cultivation is most successful at an elevation of about 5000 feet and a temperature of 16-17°C. Seedlings, about 6 months old, grown from seeds of specially selected, superior trees are taken from the nursery beds and transplanted to larger beds. When the trees are 2-3 feet in height they are planted in the gardens. Propagation by grafting is also practiced.—For the most part bark is harvested by removing long, vertical strips and covering the denuded parts with moss, or by cutting down the trees to stumps of a certain height in order to let them renew their stems by fresh buddings. Bark for pharmaceutical purposes is removed in large sections and carefully prepared and rolled into "pipes," but bark used for the manufacture of quinine salts is scraped off after it has been beaten with wooden hammers. Drying is done in the sun as far as possible, but artificial drying at 100°C. is used to remove 10-15 per cent of moisture not removable at air temperature. Alkaloids are found in all parts of the plant, but principally in the parenchyma of the outer cortex. About 90 per cent of the world's production of *Cinchona* bark comes from Java. Until 1913, *Cinchona* bark was sold in Amsterdam at public auction, but in recent years England, the U. S. A., and Japan have been the largest buyers.—*C. M. Sterling.*

1584. FARWELL, O. A. The identity of commercial Blue Flag. Amer. Druggist and Pharm. Rec. 67: 29. 1919.

1585. FISCHER, HANNS. Heilpflanzen und Siedlung. [Medicinal plants and colonization.] Pharm. Zentralhalle 61: 279-281. 1920.—The cultivating and gathering of medicinal plants were neglected before the war. Germany was largely dependent on domestic drugs during the war and the author emphasizes the need for continuing domestic collecting and suggests that medicinal plants be cultivated wherever opportunity allows.—*H. Engelhardt.*

1586. GRANT, E. H. New tests for some purgative drugs. Pharm. Era 53: 295-296. 1920.

1587. GRIEBEL, C., UND A. SCHÄFER. Majoranpulververfälschung durch Bohnenkraut. [Imitation of marjoram powder by summer savory.] Zeitschr. Untersuch. Nahrungs- u. Genussmittel 39: 299-300. 1920.—Morphological distinctions between the two are described with illustrations.—*H. G. Barbour.*

1588. GUNN, J. W. C. The action of *Urginea Burkei* (Baker). Trans. Roy. Soc. South Africa 9: 197-204. 5 fig. 1921.—The results of a large number of experiments show that *Urginea Burkei* (Baker), the Transvaal Slang Kop, has the same actions as the digitalis bodies. It is suggested that it might possibly be used as a South African substitute for squills.—*E. M. Doidge.*

1589. GUPTA, S. N. Coffee and its antiseptic value. Pacific Pharm. 12: 57-59. 1918.

1590. HAMILTON, HERBERT C. Interesting features of *Digitalis*. Pharm. Era 53: 103-104, 134-136. 1920.

1591. HERZFELD, H. *Ilex paraguensis* or La Yerba Mate. Pharm. Era 53: 353-354. 1920.—The origin, history, preparation, physiological effects, chemical composition, and therapeutic indications of this beverage commonly used by all classes of South Americans are recounted.—*C. M. Sterling.*

1592. HUMPHREY, N. The cultivation of medicinal plants. Gard. Chron. 69: 175. 1921.—The author reviews a paper read before the North British Branch of the Pharmaceutical Society of Great Britain by R. GLADE GUYER. A medicinal plant farm was started at Narriston, Edinburgh, in 1915 by Duncan, Plockharr and Company, where aconite, belladonna, colchicum, foxglove, henbane, poppies, roses, stramonium, and valerian are grown commercially and experiments have been conducted with broom, calendula, dandelion, elder, and *veratrum*. Notes are given on a few of these plants.—*P. L. Ricker.*

1593. KEBLER, LYMAN F. Suggested changes in the U. S. Pharmacopoeia. Druggists Circ. 63: 483-485. 1919.

1594. KOCH, FELIX J. Interesting differences between the familiar pie-plant of the markets and the medicinal herb from over-seas. Amer. Druggist and Pharm. Rec. 68: 42-46. 1920.

1595. KOCH, FELIX J. Raising ginseng in Kentucky. Amer. Druggist and Pharm. Rec. 67<sup>11</sup>: 36. 1919.

1596. KREMERS, EDWARD. Problems in plant chemistry. Pharm. Era 63: 325-326. 1920.—Problems presented to the author by the cultivation and working up of medicinal plants on a large scale are discussed.—*C. M. Sterling.*

1597. KRYZ, F. Ein Beitrag zur Kenntnis der Farbstoffe der Hagebutten, der Hollunderbeeren und verwandter Beeren. [Coloring matter of hip, elder, and related berries.] Zeitschr. Untersuch. Nahrungs- u. Genussmittel 38: 364-366. 1919.—The author describes the chemical characteristics of these colors.—*H. G. Barbour.*

1598. McNAIR, JAMES B. The transmission of *Rhus* poison from plant to person. Amer. Jour. Bot. 8: 233-250. 1921.—The author reviews in some detail the previous literature on the subject. He then describes a series of experiments which indicate that the poison of *Rhus diversiloba* is not volatile, since (a) it is not distillable, (b) the smoke of the burning plant is not poisonous when filtered, (c) emanations from uninjured leaves are not poisonous, (d) dermatitis occurs only on those points on the skin where the sap has been applied, (e) the poison does not diffuse rapidly in the skin, and (f) the period of latency is too long. The author concludes that the poison is confined exclusively to the resinous sap. Malignancy of the leaf decreases on drying. Poisoning without contact with the plant may occur from the



smoke of the burning plant or by contact with substances that have the poisonous sap on them.—*E. W. Sinnott.*

1599. MAIDEN, J. H. The larkspurs as poisonous plants. Agric. Gaz. New South Wales 32: 326. 1921.—The article briefly reviews our knowledge of *Delphinium* toxic to mammals and insects.—*L. R. Waldron.*

1600. NESTLER, A. Über den Nachweis von Rhinanthin im Mehl. [Identification of rhinanthin in flour.] Zeitschr. Untersuch. Nahrungs- u. Genussmittel 39: 41-44. 1920.—Rhinanthin is a glucoside from seeds of *Alectorolophus hirsutus* and *Melampyrum arvense* with which meal may be adulterated, producing a blue or blue-green color in the presence of acid. The result is known as "blue bread." Hydrochloric acid (5-10 per cent) is used in the identification test described.—*H. G. Barbour.*

1601. PETRIE, J. M. Cyanogenesis in plants. Part IV. The hydrocyanic acid of *Heterodendron*—a fodder plant of New South Wales. Proc. Linn. Soc. New South Wales 45: 447-459. 1920.—*Heterodendron oleaefolia* Def. (Sapindaceae), an endemic Australian evergreen tree or large shrub, has been much used for cattle feeding during drought, and many deaths have resulted. It is popularly known as rosebush, whitewood, rosewood, western rosewood, emubush, cabbagebush, boonery tree, dogwood, ironwood, bluebush, and bullockbush without reference to the application of these names elsewhere. It was found to contain a cyanogenetic glucoside yielding, when hydrolyzed, 0.328 per cent of hydrocyanic acid. It is therefore one of the most poisonous cyanogenetic plants known, yielding more than twice as much hydrocyanic acid as bitter almonds. One ounce of the air-dried leaves forms a lethal amount for 1 sheep. The leaves are invariably found to be deficient in enzyme, and require the addition of emulsin to bring about the complete decomposition of the glucoside. The foliage of the wild orange, *Capparis Mitchellii* Lindl. (Capparidaceae), was also found to be cyanogenetic; this is thought to be the 1st record in this family. Several of the Sapindaceae have been shown to be cyanogenetic, including *Ungnadia speciosa* Endl. of Mexico and Texas.—*Eloise Gerry.*

1602. PETRIE, J. M. The chemical examination of *Macrozamia spiralis* Miq. Proc. Linn. Soc. New South Wales 45: 424-442. 1920.—This cycad grows abundantly along the east coast of New South Wales and has been regarded as a poisonous plant from the earliest days of the colony. A summary of its poisonous record is given including many instances where it was fatal to stock. The chemical composition of its leaves is characterized by a large amount of amorphous resins. The following constituents were identified: Formic, acetic, valeric, and lauric acids, also oleic, stearic, and higher fatty acids, and a very volatile essential oil; a phytosterol (melting point 132°C., optical rotation—34.5, melting point of acetate, 120°C.); a paraffin, with the properties of triacontane, C<sub>30</sub>H<sub>62</sub>; and an olefine having the properties of octodecylene. The nuts contained 39 per cent of starch and much mucilage. In feeding experiments, white rats were given, with their ordinary food, (1) the crushed fresh leaves, (2) the grated seeds, (3) the rich, fatty, resinous components extracted from the leaves by ether (which Dr. LAUTERER stated contained the poisonous principle), and (4) the aqueous extract of the leaves and the seeds (by which the aborigines believed the poison was removed). The animals showed no signs of being affected after 3 weeks' feeding. The material was apparently not poisonous to white rats and no active poison principle was isolated or identified. With careless feeding, however, the animals are easily killed by impaction, which is due to the fibrous nature of the material.—*Eloise Gerry.*

1603. PHILLIPS, E. P. The genus *Bersama*. Bothalia 1: 33-39. 1921.—The genus *Bersama* was monographed by E. G. BAKER (Jour. Bot. 45: 12. 1907) and 2 species were described from South Africa. The interest in the various species was first aroused by Mr. C. C. Robertson, M. F., who sent samples of the bark to the Imperial Institute for examination, as it was reported that the natives use the bark medicinally. Under the name *B. tysoniana* 3 species have been included, *B. tysoniana*, *B. Swinnyi*, and *B. Stayneri*. The bark of all is used medicinally by the natives.—*E. P. Phillips.*

1604. RUSBY, H. H. Suggestions for the revision of the pharmacopoeia. *Druggists Circ.* 64: 123-126. 1920.

1605. RUSBY, H. H. Suggestions for the revision of the United States Pharmacopoeia. *Amer. Druggist and Pharm. Rec.* 63<sup>3</sup>: 24-30. 1920.

1606. RUSBY, H. H. The H. K. Mulford Biological Expedition. *Druggists Circ.* 64: 425-426. 1920.—A biological expedition, sponsored by the H. K. Mulford Co., in charge of Dr. Rusby will visit the upper Amazon valley, reaching southeastern Colombia and north-western Brazil. The object is to investigate the medicinal plants of the region, but a study of the insects and reptiles abounding in the region will be undertaken by specialists and the fishes of the Amazon will receive especial attention. It is expected that the expedition will be isolated from civilization for about 6 months.—*C. M. Sterling.*

1607. SCHNEIDER, ALBERT. Pharmaceutical research. *Druggists Circ.* 65: 163-165. 1921.—The author discusses research and its necessity in pharmacy. A plan for the development of research in pharmacy and related subjects is presented.—*C. M. Sterling.*

1608. SEEL, E. Beiträge zur Kenntnis der Chemie und Pharmakologie der Aloe. [Chemistry and pharmacology of aloes.] *Arch. der Pharm.* 257: 212-259. 1919.—The important constituents of aloes are given as: (1) Water-soluble crystalline aloin; (2) water-soluble amorphous aloetin; (3) resinous portion (insoluble in cold water); and (4) emodin (methyltrioxanthraquinone or oxymethyldioxanthraquinone). Detailed chemical analyses are given. 0.5-2.0 gr. of the puraloin (oxidation products of aloin) were found to give a mild purgative effect in children and dogs, but this was not dependable. The reliability of emodin as a cathartic in doses of 0.2-0.4 gr. at 3-hour intervals is confirmed. Oxyemodin is somewhat weaker, 0.5 gr. often being required. Like emodin it can be injected hypodermically. The only important effect of oxidizing aloe constituents with sodium peroxide appears to have been the purification of emodin itself.—*H. G. Barbour.*

1609. STOCKBERGER, W. W. Commercial drug growing in the United States in 1918. *Amer. Druggist and Pharm. Rec.* 68<sup>2</sup>: 17-18. 1920.—Recent work to obtain marketable quantities of Belladonna, Cannabis, Digitalis, Calendula, sage, and henbane is reviewed.—*C. M. Sterling.*

1610. STOCKBERGER, W. W. Crude drug situation in the United States. *Western Druggist* 43: 21-24. 1921.—The author reviews the crude drug supplies in the U. S. A. at the close of the World War. By way of improvement he suggests cultivation of plants in medicinal gardens, and the cooperation of state schools of pharmacy, botanists, high school teachers, and county agents in compiling information concerning the drug resources of the states.—*C. M. Sterling.*

1611. SWANSON, C. O. Hydrocyanic acid in Sudan grass and its effect on cattle. *Jour. Amer. Soc. Agron.* 13: 33-36. 1921.—Sudan grass giving a strong test for HCN was not harmful to cattle. Liberation of HCN from Sudan grass is apparently associated with enzyme action. Slow drying causes HCN to disappear. The amount of HCN obtained was not diminished when Sudan grass was made into silage. Frosted Sudan grass, when tested immediately, gave very large amounts of HCN which rapidly disappeared when the plant wilted.—*F. M. Schertz.*

1612. WALLACE, EMMA GARY. Some facts concerning camphor farming. *Pharm. Era* 53: 261-262. 1 fig. 1920.—An account of recent plans to furnish native-grown camphor for the American market is given.—*C. M. Sterling.*

1613. WATERMEYER, F. W. American liquid styrax. *Amer. Druggist and Pharm. Rec.* 68<sup>2</sup>: 20. 1920.—American styrax, obtained from *Liquidambar styraciflua*, has been collected from large forests of trees located in Honduras. The species occurs in the southern states also, but in relatively small quantities. For many purposes the American styrax is superior to



the Asiatic and will probably be in demand when normal supplies of Asiatic styrax are again available.—*C. M. Sterling.*

1614. WHITE, F. ASHFORD. A glimpse of Grasse, the home of the French perfumery industry. *Amer. Druggist and Pharm. Rec.* 68: 18-20. 7 fig. 1920.

## PHYSIOLOGY

B. M. DUGGAR, *Editor*

CARROLL W. DODGE, *Assistant Editor*

(See also in this issue Entries 1258, 1291, 1323, 1344, 1385, 1407, 1409, 1410, 1415, 1419, 1481, 1490, 1492, 1495, 1539, 1611, 1664)

## DIFFUSION, PERMEABILITY, ADSORPTION

1615. LOEB, JACQUES. Ionic radius and ionic efficiency. *Jour. Gen. Physiol.* 2: 673-687. 1920.—The writer has previously demonstrated that when solutions of electrolytes are separated from water by membranes, the ions with the same sign as that of the membrane increase while ions of opposite sign decrease diffusion of water through the membranes, and that the effects of these ions increase with an increase in valency. Aside from valency the so-called ionic radius, the distance between the central positive nucleus and the outermost ring or shell of electrons, also influences the rate of water diffusion. It is shown in this paper that the accelerating and depressing effects of anions increase directly with the order of magnitude of their radii in the order  $\text{Cl} < \text{Br} < \text{I}$ , while these effects of cations increase inversely as the radii in the order  $\text{Rb} < \text{K} < \text{Na} < \text{Li}$ . This is explained on the assumption that the action of ions is electrostatic. The effect of the extra positive charge on the nucleus of a cation, therefore, will be greater the smaller the radius, while the effect of the excess electron of the anion will be greater the greater its distance from its own positive nucleus. It is suggested that a similar explanation might be adjusted to apply to polyatomic ions.—*Otis F. Curtis.*

1616. LOEB, JACQUES. The reversal of the sign of the charge of collodion membranes by trivalent cations. *Jour. Gen. Physiol.* 2: 659-671. 1920.—The writer gives evidence to show that a collodion membrane treated with protein becomes positively charged when in contact with salts of trivalent cations. This reversal of charge is similar to that induced by acid (see Bot. Absts. 8, Entry 607). The reversal of the charge induced by trivalent cations, however, occurs on the alkaline side of the isoelectric point of the protein. Collodion membranes not treated with protein can not be induced to assume a positive charge by treatment with either trivalent cations or acid.—*Otis F. Curtis.*

## WATER RELATIONS

1617. HOTTES, C. F. A constant humidity case. [Abstract.] *Phytopath.* 11: 51. 1921

## MINERAL NUTRIENTS

1618. ANONYMOUS. Disintegration of roofing tile. *Sci. Amer. Monthly* 3: 244. 1921.—The contributor quotes J. SCOTT (*British Clay Worker* 29: 138-140. 1920) to the effect that *Mucor racemosus* attacks roofing tile and thus obtains part of its food, causing the tile to disintegrate.—*Chas. H. Otis.*

1619. DICKSON, JAMES GEERE. The relation of certain nutritive elements to the composition of the oat plant. *Amer. Jour. Bot.* 8: 256-274. 2 fig. 1921.—The effect of limiting certain essential nutrient elements upon the chemical composition of the plant was studied. Pedigreed Swedish oats, *Avena sativa aristata*, were grown in sand cultures watered by nutrient solutions. The latter consisted of a modified Knop's solution (as a control) and 5 other modified solutions, in each of which 1 of the elements magnesium, calcium, potassium, phosphorus,

and nitrogen was reduced to  $\frac{1}{10}$  of the quantity present in the normal solution. Plants were grown to maturity in each case. The calcium content of both grain and straw is reduced to about 10 per cent of that in the controls by reducing the calcium in the culture solution to  $\frac{1}{10}$  the quantity in the complete solution. It is greatly reduced in both grain and straw by a similar deficiency in phosphorus or nitrogen. By reducing the phosphate in the culture solution to  $\frac{1}{10}$  of the quantity in the complete solution used as control, the total phosphorus content of the grain is thereby reduced to 46 per cent and that of the straw to 10 per cent of the quantity found in the complete solutions. It is slightly reduced in both grain and straw by a similar deficiency in potassium, and is increased by a similar reduction of calcium or nitrogen. Variations in composition are more pronounced in straw, but in general are similar in both grain and straw. The phosphorus content of both grain and straw is modified by seasonal differences except in phosphorus-deficient solutions. The calcium content of the grain is modified by seasonal differences even in calcium-deficient solutions. The calcium content of the straw shows no consistent response to climate.—*E. W. Sinnott.*

1620. ESPINO, R. B. A preliminary study of the mineral nutrition of young cotton plants. *Philippine Agric. Rev.* 13: 335-343. 1920.

1621. HOWE, H. E. Some of the new applications of sulfur in agriculture. *Sci. Amer.* 124: 392. 1921.—This is a condensation of an article by J. G. LIPMAN in a recent issue of the *Chemical Age*.—*Chas H. Otis.*

1622. MEIER, HENRY F. A., AND CLIFTON E. HALSTEAD. Hydrogen-ion concentration relations in a three-salt solution. *Soil Sci.* 11: 325-351. *Pl. 1, 9 fig.* 1921.—Fulcaster wheat was grown for a period of 35 days in water cultures containing potassium dihydrogen phosphate, calcium nitrate, and magnesium sulphate in varying proportions and having a total osmotic value of 1 atmosphere. The solutions were changed at 3-day intervals and the hydrogen-ion concentration determined at each change. No one combination of the 3 salts gave constantly a maximum yield of tops, roots, or total dry weight in the 3 sets grown at different periods. The cultures giving maximum dry weights exhibited minimum water requirements. The hydrogen-ion concentration of acid solutions in which the wheat was grown tended to approach neutrality. There was no apparent correlation between the yield of the plant and the hydrogen-ion concentration, or change in hydrogen-ion concentration. Those degrees of acidity which are just harmful to *Actinomyces* and *Azotobacter* have no visible effect on wheat.—*W. J. Robbins.*

1623. TRELEASE, S. F., AND P. PAULINO. The effect on the growth of rice of the addition of ammonium and nitrate salts to soil cultures. *Philippine Agric. Rev.* 13: 293-313. 1920.—The highest yields were secured when nitrogen was supplied as ammonium sulphate, the next higher in order being with nitrate—calcium nitrate and sodium nitrate.—*E. D. Merrill.*

### PHOTOSYNTHESIS

1624. YAP, G. G. A study of the photosynthesis of sugar cane. *Philippine Agric.* 8: 269-276. 1920.—The general conclusions are as follows: The rate of photosynthesis decreased from 10 in the morning to 4 in the afternoon, the leaves being most active from 8 to 10 in the morning; young leaves are more active than old ones; the rate of respiration was apparently less than  $\frac{1}{2}$  that of photosynthesis; high light intensity probably has an indirect relation to the rate of photosynthesis, tending to decrease photosynthetic activity.—*E. D. Merrill.*

### METABOLISM (GENERAL)

1625. DELAUNEY, P. Nouvelles recherches concernant l'extraction des glucosides chez quelques orchidées indigènes: identification de ces glucosides avec la loroglossine. [The extraction of glucosides from certain indigenous orchids and the identification of these glucosides with loroglossin.] *Compt. Rend. Acad. Sci. Paris* 172: 471-473. 1921.—The glucoside, lora-



glossin, is now found in 3 other orchids besides in the 2 previously reported [see also Bot. Absts. 8, Entry 582].—C. H. Farr.

1626. FULMER, ELLIS I., VICTOR E. NELSON, AND F. F. SHERWOOD. The nutritional requirements of yeast. I. The role of vitamins in the growth of yeast. Jour. Amer. Chem. Soc. 43: 186-191. 1921.—This paper presents data showing that water soluble B is not a necessary constituent of a medium for the growth of yeast.—J. M. Brannon.

1627. KOHLER, DENISE. Variation des acides organiques au cours de la pigmentation anthocyanique. [Variation in the organic acids during the formation of anthocyan pigments.] Compt. Rend. Acad. Sci. Paris 172: 709-711. 1921.—This is a study of anthocyan formation in the corolla of *Cobaea scandens*, the leaves of *Ampelopsis tricuspidata*, etc. An increase in organic acids was found in all cases in which the part of the plant experimented on was left attached to the plant; but no such increase occurred if the part was detached. In buckwheat leaves more acids are formed in darkness than in light.—C. H. Farr.

1628. LOEB, JACQUES. La chimie des protéines et des colloïdes. [The chemistry of proteins and colloids.] Rev. Gén. Sci. Pures et Appl. 32: 197-202. 1921.—This is a translation by G. Loewyand and W. Westrezat of an article appearing in Science 52: 449-456. 1920.—H. W. Anderson.

1629. POSTERNAK, S. Sur la constitution chimique et la synthèse du principe phosphoorganique de réserve des plantes vertes. [Chemical composition and synthesis of the phosphoorganic reserve substance in green plants.] Compt. Rend. Soc. Phys. et Hist. Nat. Genève 37: 70-74. 1920.—The compound often designated phytic acid has never been found outside of green plants, where it occurs in seeds, tubers, rhizomes, and bulbs. It is found in the aleurone layer as a double salt of calcium and magnesium; also in the oily seeds of *Picea excelsa*, *Cannabis sativa*, and *Cucurbita pepo*. The investigation of the compound is made possible by the discovery of the crystallizable double salt  $C_6H_{12}O_{27}P_6Ca_4Na_8$ . The free acid is found to have the composition  $C_6H_{24}O_{27}P_6$ , which upon hydrolysis splits up thus:  $C_6H_{24}O_{27}P_6 + 3H_2O = C_6H_{12}O_6 + 6H_3PO_4$ , the reaction pointing toward the substance being inositehexaphosphoric ether of the formula  $C_6H_{12}O_{24}P_6$ . The substance, however, differs from the latter in having the equivalent of 3 additional molecules of water of constitution, which cannot be driven off without decomposing the material. The synthesis of inositehexaphosphoric ether shows, however, that it is indeed identical with the substance in question, and possesses the peculiarity of retaining 3 molecules  $H_2O$  so firmly as to resist dehydration without the attendant decomposition.—Charles Drechsler.

### METABOLISM (ENZYMES, FERMENTATION)

1630. BATTELLI, F., ET L. STERN. Oxydations et réductions fermentatives. [Oxydations and reductions by enzymes.] Comp. Rend. Soc. Phys. et Hist. Nat. Genève 37: 65-68. 1920.—The author investigated the plausibility of WIELAND's views concerning the action of oxydases in biological oxidations, according to which these behave like platinum black, activating the hydrogen of reducing substances, and transferring it to substances combining with the latter. This theory rests on the hypothesis that oxidations and reductions are effected by the same enzymes. The author also studied the action of oxydases known to be present in the tissue of higher animals on compounds oxidized by them, in the presence of thionine. The oxydases of citric acid, succinic acid, phenylenediamine, uric acid, and alcohol were thus investigated. The results were held to confirm Wieland's hypothesis of the identity of oxydases and reductases; but they indicated, too, that his hypothesis concerning the mechanism of oxidations was wrong, this being explained better by a modification of Traube's theory modernized by the introduction of a knowledge of ionization.—Charles Drechsler.

1631. EPSTEIN, ALEXANDRE. L'activité d'un ferment en fonction de la tension superficielle du milieu. [The activity of an enzyme in relation to surface tension of medium.] Compt.

Rend. Soc. Phys. et Hist. Nat. Genève 37: 74-79. 1920.—Investigating the relation of the surface tension of a medium containing an enzyme to its activity, the author studied the activity of tyrosinase in the presence of increasing concentrations of monovalent alcohols. It was found that whatever alcohol was used, solutions of equal surface tensions produced comparable results, the maximum stimulation occurring at surface tension 70, and the post-optimum decline becoming more gradual with increase in the length of the carbon chain. Comparing the effect of alcohol with that of ether, chloroform, and acetone, the author concludes that the hydroxyl group has a weak inhibitory effect on tyrosinase. The activity of tyrosinase in the presence of alcohol is then the resultant of the stimulating effect induced by lowering the surface tension, of the depressing effect of the hydroxyl group, and of the retarding influence arising from the displacement of the enzyme by the alcohol at the surface of the two phases.—*Charles Drechsler*.

1632. GREIG-SMITH, R. Ropiness in wattle bark infusions. Proc. Linn. Soc. New South Wales 45: 52-89. Pl. 9. 1920.—Ropiness is often encountered in tanning liquors and there may be many causative organisms. This study was made on wattle bark infusions only, but the results are considered applicable to tanning liquors. Two closely allied bacteria, designated A and B, were isolated. They caused mucinous fermentation of bark infusions and of synthetic media containing sugar. The chemistry of the reactions and products is discussed. Information obtained from tanners on the occurrence of ropiness in other than wattle bark liquors is appended.—*Eloise Gerry*.

1633. HÉRISSEY, H. Sur l'hydrolyse du méthyl-d-mannoside  $\alpha$  par les ferments solubles. [The hydrolysis of methyl-d-mannoside  $\alpha$  by soluble ferments.] Compt. Rend. Acad. Sci. Paris 172: 766-768. 1921.—Germinating seeds of lucerne are shown to contain d-mannosidase.—*C. H. Farr*.

1634. MUELLER, EDWARD. The chemistry of enzyme actions. [Rev. of: FALK, K. GEORGE. The chemistry of enzyme action. 136 p. Chemical Catalogue Company: New York, 1921.] Amer. Jour. Public Health 11: 546. 1921.

1635. NORTHROP, JOHN H. The influence of the substrate concentration on the rate of hydrolysis of proteins by pepsin. Jour. Gen. Physiol. 2: 595-611. 1920.—It is pointed out that the apparent exceptions to the law of mass action found in enzyme reactions may be found in catalytic reactions in strictly homogeneous solutions.—These deviations in the rate of reaction from the law of mass action may be explained by the hypothesis that the active mass of the reacting substances is not directly proportional to the total concentration of substance taken.—In support of this suggestion it is shown that for any given concentration of pepsin the relative rate of digestion of concentrated and of dilute protein solutions is always the same. If the rate of digestion depended on the saturation of the surface of the enzyme by substrate the relative rate of digestion of concentrated protein solutions should increase more rapidly with the concentration of enzyme than that of dilute solutions. This was found not to be true, even when the enzyme could not be considered saturated in the dilute protein solutions.—The rate of digestion and the conductivity of egg albumin solutions of different concentration were found to be approximately proportional at the same PH. This agrees with the hypothesis first expressed by PAULI that the ionized protein is largely or entirely the form which is attacked by the enzyme.—The rate of digestion is diminished by a very large increase in the viscosity of the protein solution. This effect is probably a mechanical one due to the retardation of the diffusion of the enzyme.—*Author's summary*.

1636. SCHMITZ, HENRY. Enzyme action in *Echinodontium tinctorium* Ellis and Everhart. Jour. Gen. Physiol. 2: 613-616. 1920.—Mats of the tissue of *Echinodontium tinctorium*, a destructive wood-destroying fungus, which had grown for 3 months in pure culture on sliced carrots, were dried and powdered. Tests showed the presence of the following enzymes: Esterase, maltase, lactase, sucrase, raffinase, diastase, inulase, cellulase, hemicellulase,



urease, rennet, and catalase. Tests for the presence of amidase, tannase, proteases, also esterases acting on olive oil emulsion, and triacetin showed negative results.—*Otis F. Curtis.*

1637. WEISS, FREEMAN, AND R. B. HARVEY. Catalase, hydrogen-ion concentration and growth in the potato wart disease. [Abstract.] *Phytopath.* 11: 57-58. 1921.

### METABOLISM (RESPIRATION)

1638. ANONYMOUS. Gaseous exchanges between plant roots and the air. *Sci. Amer. Monthly* 3: 217. 1921.—This is a brief report of the results of the experiments of M. RAOUL CERIGHELLI (see Bot. Absts. 8, Entry 652).—*Chas. H. Otis.*

1639. GUSTAFSON, F. G. Comparative studies on respiration. II. The effect of hydrogen ion concentration on the respiration of *Penicillium chrysogenum*. *Jour. Gen. Physiol.* 2: 617-626. 1920.—For the most part measurements were taken of the time necessary to produce a given amount of CO<sub>2</sub>, though in a few cases oxygen absorption was measured. Considering respiration in a neutral solution as normal, changes in concentration between PH 4-8 had practically no effect on the normal rate. Decreasing the PH value to 2.65 caused a gradual rise followed by a gradual return to normal, while at PH 1.10-1.95 the preliminary rise of about 20 per cent was followed by a fall to below normal within 60 minutes. Increasing the PH value to 8.80 resulted in a decrease in respiration to 60 per cent of the normal. The decrease in respiration due to a PH value of 1.95 or less was not reversible, while a similar decrease in rate which occurred at 8.80 was reversible.—*Otis F. Curtis.*

1640. NICOLAS, M. G. Contribution à l'étude des relations qui existent, dans les feuilles, entre la respiration et la présence de l'anthocyane. [Relations between respiration and the presence of anthocyan in leaves.] *Rev. Gén. Bot.* 31: 161-178. 1919.—The author cites some literature, the evidence from which indicates that there is a relation, though not a direct one, between the presence of oxygen and the occurrence of red, blue, and similar pigments found in fruits and flowers.—Of 2 plants belonging to the same species, one of which is red and the other green, the former possesses fewer chloroplasts, manufactures less carbohydrate, and so exhibits a less intense gaseous exchange. There is apparently a greater fixation of oxygen in the red leaves than in the green. Where acids accumulate, there is a decrease in respiratory intensity. The acids are the result of the incomplete oxidation of sugar, and the red color depends on the formation of these acids. This accounts for the apparent necessity of oxygen in the production of the red color.—*J. M. Brannon.*

### ORGANISM AS A WHOLE

1641. FULMER, ELLIS I., VICTOR E. NELSON, AND F. F. SHERWOOD. The nutritional requirements of yeast. II. The effect of the composition of the medium on the growth of yeast. *Jour. Amer. Chem. Soc.* 43: 191-199. 1921.—The following is the medium which the authors find best for the growth of yeast: 100 cc. of the medium contains 0.188 gr. of ammonium chloride, 0.100 gm. of dipotassium phosphate, 0.040 gr. of precipitated calcium carbonate, 0.60 gr. of dextrin, and 10 gr. of cane sugar. The authors think it possible that such a colloidal material as dextrin protects the yeast against poisonous substances.—*J. M. Brannon.*

1642. HOPKINS, E. F. Hydrogen-ion concentration of the soil and seedling infection by *Gibberella saubinetii*. [Abstract.] *Phytopath.* 11: 36-37. 1921.

### GROWTH, DEVELOPMENT, REPRODUCTION

1643. HOPKINS, E. F. Growth and germination of *Gibberella saubinetii* at varying hydrogen-ion concentrations. [Abstract.] *Phytopath.* 11: 36. 1921.

1644. K[ENOYER], L. A. [Rev. of: GARNER, W. W., AND H. A. ALLARD. *Effect of the relative length of day and night and other factors on growth and reproduction in plants.* Jour. Agric. Res. 18: 553-605. 1920 (see Bot. Absts. 5, Entry 22).] Jour. Indian Bot. 2: 92. 1921

1645. MASON, T. G. A note on poling in some fibre agaves. Agric. News [Barbados 20: 84. 1921.—“The longevity of the plant and the number of years throughout which the crop can be secured, is of course decided by the number of years the plant passes in the purely vegetative state before poling and dying.” Premature poling might render the cultivation of fiber-agaves impossible since it would not allow the planter sufficient time to recover his expended capital. An experiment with agave planted from bulbils was started in Montserrat in September, 1902. Instead of a 4-year period, the leaves were ready for reaping in 2 years, and by 1907, 25 per cent of the plants had poled. Apparently the whole life cycle of the plants was accelerated; 4 good crops had, however, been produced before the plants were dug out. After a reference to the kind of soil and climatic conditions best suited to the cultivation of agaves, the author concludes by pointing out the necessity for experimentation to determine the factors influencing premature poling.—J. S. Dash.

1646. SCHAFFNER, J. H. Reversal of the sexual state in certain types of monoecious inflorescences. Ohio Jour. Sci. 21: 185-200. Pl. 1-2. 1921.—A list is given of common plants in which a complete change from one sexual state to the other takes place in the inflorescence. A detailed study of 7 species shows the character of the morphological expressions on the transition zone between tissues in a male state and those in a female state. Maleness and femaleness in plants are shown to be quantitative, reversible states arising during vegetative growth from neutral states. It is thought that sex can be controlled and changed from one state to another.—H. D. Hooker, Jr.

### MOVEMENTS OF GROWTH AND TURGOR CHANGES

1647. COUPIN, HENRI. Sur une tige à géotropisme horizontal. [A stem which displays horizontal geotropism.] Compt. Rend. Acad. Sci. Paris 172: 608-610. 1921.—If seedlings of certain lentils are grown in darkness, the stems assume a horizontal position; if placed upright, they curve over to the horizontal again. They thus display a plagiotropism. If illuminated equally on all sides, they show ordinary negative geotropism.—C. H. Farr.

### TEMPERATURE RELATIONS

1648. BERTRAND, GABRIEL, ET ARTHUR COMPTON. Influence de la chaleur sur l'activité de la salicinase. [The influence of temperature on the activity of salicinase.] Compt. Rend. Acad. Sci. Paris 172: 548-551. 1921.—It was found that for salicinase of almond the lethal and optimum temperatures are decreased as the duration of exposure to the temperature is increased. The maximum temperature at which activity takes place is the same as the temperature of instantaneous destruction of the enzyme.—C. H. Farr.

### TOXIC AGENTS

1649. NOBÉCOURT, PIERRE. Action de quelques alcaloïdes sur le *Botrytis cinerea* Pers. [The effect of certain alkaloids on *Botrytis cinerea*.] Compt. Rend. Acad. Sci. Paris 172: 706-708. 1921.—The basis of immunity in plants is often attributed to the presence of alkaloids, or related products, in the tissues of the host. *Botrytis cinerea* was chosen for this study because it is parasitic on so many plants, including *Nicotiana*, *Cinchona*, and *Atropa belladonna*, as well as other plants which are high in alkaloids. Such alkaloids as atropine, nicotine, aconitine, and quinine sulphate were used with this fungus and these showed no toxic effects at concentrations greater than those commonly occurring in the host plants.—C. H. Farr.

1650. OSTERHOUT, W. J. V. The mechanism of injury and recovery. Jour. Gen. Physiol. 3: 15-20. 1920.—During the changes leading to injury or death the resistance of many tissues to the passage of an electric current is altered, and this change in conductivity, since it can



be accurately determined, has been used by the writer as a measure of injury or recovery. It is assumed that the conductivity of the tissue of *Laminaria Agardhii* as found in sea water is normal and that a change in conductivity may be used as a measure of injury or recovery. The writer then exposed such tissues to certain solutions affecting permeability (of the same conductivity as sea water) for short periods. Upon returning them to sea water there was complete recovery. When exposed for longer periods recovery was only partial, indicating permanent injury. The writer's conception is that recovery is not a reversal of the reactions which produce injury, but that the reactions involved are practically irreversible and that injury and recovery differ only in the relative speed at which certain steps take place in a series of reactions which progress chiefly in one direction.—*Otis F. Curtis.*

1651. OSTERHOUT, W. J. V. A theory of injury and recovery. I. Experiments with pure salts. Jour. Gen. Physiol. 3: 145-156. 1920.—Continuing work and using methods previously described (see preceding entry), the writer has experimented on the effects of solutions of NaCl and CaCl<sub>2</sub> on the conductivity of tissue of *Laminaria Agardhii*. Assuming that changes occur in series  $O \rightarrow S \rightarrow A \rightarrow M \rightarrow B$  and that the resistance of the tissue is proportional to the amount of M, equations are developed which make it possible to predict, after any length of exposure to solutions of NaCl or CaCl<sub>2</sub>, the resistance of the tissue during the exposure as well as the resistance during recovery. The calculated data were found to agree very closely with the experimental data.—*Otis F. Curtis.*

1652. OSTERHOUT, W. J. V. A theory of injury and recovery. II. Experiments with mixtures. Jour. Gen. Physiol. 3: 415-429. 1921.—Equations which serve to predict injury and recovery as measured by electrical conductivity of tissues when placed in pure salts (see preceding entry) will also serve to predict the injury and recovery of such tissues when exposed to mixtures of the two salts.—*Otis F. Curtis.*

1653. OSTERHOUT, W. J. V. A theory of injury and recovery. III. Repeated exposures to toxic solutions. Jour. Gen. Physiol. 3: 611-622. 1921.—The equations previously used (see the preceding entries) may be used also to predict the behavior of tissues when transferred, with varying sequence, from sea water to solutions of the pure salts, or mixtures, and from thence to other solutions of pure salts or to sea water. It is suggested that explanations similar to the one advanced (see the 2 preceding entries) may be applied to other fundamental life processes.—*Otis F. Curtis.*

1654. SCHOENHOLZ, P., AND K. F. MEYER. The optimum hydrogen-ion concentration for the growth of *B. typhosus*, and *B. paratyphosus* A and B. Jour. Infect. Diseases 28: 384-393. 1921.—*B. typhosus* has a range of growth equivalent to  $P_H$  5.0-8.6, with an optimum at  $P_H$  6.8-7.0, in salt-free veal infusion broth. Large variations in the hydrogen-ion concentration about the optimum zone produce only slight effects on the growth of the organisms, while slight variations near the limiting concentrations produce a marked effect. *B. paratyphosus* A and B have a range of growth similar to that of *B. typhosus* but exhibit a greater tolerance for alkali.—*Selman A. Waksman.*

1655. SMITH, THEOBALD, AND DOROTHEA E. SMITH. Inhibitory action of paratyphoid bacilli on *Bacillus coli*. 1. Jour. Gen. Physiol. 3: 21-33. 1920.—Gas and acid formation by *B. coli* grown on lactose bouillon is normal when following 4-day cultures of a number of more or less distinct strains of the "true hog-cholera bacilli" (including also *Bacillus icteroides* and *B. suispestifer*). Acid formation is normal but gas formation is inhibited when following 4-day cultures of all "true paratyphoid and enteritidis types." The inhibiting effects of the latter types disappear after incubation of about 3 weeks, while the former types produce inhibition after about the same time. The authors suggest that the inhibition is due to some metabolic product, possibly an enzyme. The presence of large numbers of the bacteria themselves did not inhibit gas formation, while the liquid remaining after centrifuging did produce inhibition. This inhibiting agent can be removed by filtering through a Berkefeld filter, by heating to about 100°C., or by clearing with kaolin.—*Otis F. Curtis.*

## SOIL SCIENCE

J. J. SKINNER, *Editor*F. M. SCHERTZ, *Assistant Editor*

(See also in this issue Entries 1101, 1109, 1124, 1147, 1153, 1257, 1398, 1404, 1416, 1417, 1619, 1621, 1642)

## ACIDITY AND LIMING

1656. CONNOR, S. I. Liming in its relation to injurious inorganic compounds in the soil. *Jour. Amer. Soc. Agron.* 13: 113-124. 1921.—In 3 ways lime may act upon injurious inorganic compounds in the soil: (1) It neutralizes soil acidity; (2) it precipitates most injurious soluble salts which are found in acid soils; (3) it acts in an antagonistic manner toward excessive soluble salts which may not be precipitated. Aluminum, iron, manganese, boron, and zinc are harmful in a soluble form but are rendered less soluble and less injurious by lime. Aluminum toxicity is prevented by an abundance of phosphates. Active forms of silicates to a certain extent aid in precipitating aluminum salts.—*F. M. Schertz.*

1657. FISHER, E. A. Studies on soil reaction I. A résumé. *Jour. Agric. Sci.* 11: 19-44. *Fig. 1-6.* 1921.—The author discusses the importance of the soil reaction as a factor in soil fertility and reviews the theories of soil acidity. Methods of determining soil acidity are discussed and the problem of soil acidity is correlated with current physico-chemical conceptions of acidity in general. The ordinary titrimetric methods and the method of HUTCHINSON-MACLENNAN of measuring soil reaction and determining lime requirements are discussed.—*V. H. Young.*

1658. FISHER, E. A. Studies on soil reaction II. The colorimetric determination of the hydrogen ion concentration in soils and aqueous soil extracts. (Preliminary communication.) *Jour. Agric. Sci.* 11: 45-65. *Fig. 1-6.* 1921.—A discussion of the electrometric and colorimetric methods of H-ion determination is presented. A method for compensating for the turbidity of soil extracts is described. Soil samples were dried and extracts made from the dried soil. Centrifuged extracts, although somewhat turbid, were found to yield more constant results than clearer filtered extracts. Such solutions do not represent the actual H-ion concentration of the soil solution but rather of a solution obtained by shaking 1 part of soil with 2 parts of water for 1 hour. An attempt is made to correlate H-ion results with the lime requirements of the soil.—*V. H. Young.*

1659. LYON, T. L. The effect of liming on the composition of the drainage water of soils. *Jour. Amer. Soc. Agron.* 13: 125-130. 1921.—The author reports on the influence of lime on the sulphur, calcium, potash, nitrogen, and phosphorus content of drainage waters.—*F. M. Schertz.*

1660. ROBINSON, R. H. Acid soil studies I. A study of the basic exchange between soil separates and salt solutions. *Soil Sci.* 11: 353-362. 1921.—Soil separates of 4 acid Oregon soils were treated with 0.1 N solutions of potassium chloride, potassium nitrate, sodium chloride, potassium acetate, and calcium acetate. By the VEITCH and JONES method the lime requirement of these soils varied from 1500-20,800 pounds of calcium carbonate per 2,000,000 pounds of soil. The acidity of the different soil separates liberated by the action of a given salt solution was approximately the same. The so-called acidity liberated by potassium nitrate, potassium chloride, and sodium chloride was due mainly to iron and aluminum rendered soluble. The acidity produced by the acetates was due to acetic acid. The H-ion concentration of the different separates of the soil was constant.—*W. J. Robbins.*

1661. ROBINSON, R. H., AND D. E. BULLIS. Acid soil studies: II. Changes in calcium compounds added to acid soils. *Soil Sci.* 11: 263-267. 1921.—In an effort to determine why



some Oregon soils do not respond to lime treatment, pure calcium carbonate or calcium oxide was added to soils in pots and allowed to weather 1 year. A crop of barley was grown in the pots. At the end of a year samples were removed from the pots and the forms into which the calcium compounds had changed determined. The calcium was found chiefly combined with humus and easily decomposable silicates. Most of the calcium present in the acid soil which does not respond to lime was found combined as difficultly decomposable silicate.—*W. J. Robbins.*

### GENERAL

1662. BECKLEY, V. A. The formation of humus. *Jour. Agric. Sci.* 11: 69-77. 1921.

1663. COLBY, G. E. A note on the use of anhydrite as a remedy for black alkali. *Monthly Bull. Dept. Agric. California* 10: 39-41. 1921.—Anhydrite was found to possess the same value as gypsum or land plaster as a chemical remedy for black alkali.—*E. L. Overholser.*

1664. FRED, E. B., AND AUDREY DAVENPORT. The effect of organic nitrogenous compounds on the nitrate-forming organisms. *Soil. Sci.* 11: 389-407. *Pl. 1-2.* 1921.—*Nitrobacter* was grown upon washed nitrite-agar and on slants of Nährstoff-Heyden agar with and without nitrite present. Microscopical examination showed that this organism does not reproduce in liquid cultures of water, urine, peptone-beef infusion, or Nährstoff-Heyden infusion. The last was non-toxic but beef infusion or peptone-beef infusion contained a non-volatile toxic substance, soluble in ether or alcohol. *Nitrobacter* will live 2-6 weeks in a 1 per cent solution of gelatine, peptone, casein, yeast water, or Nährstoff-Heyden, or in milk or distilled water. Gelatine, peptone, casein, skimmed milk, beef infusion, and beef extract do not affect the oxidation of nitrite; asparagin, ammonium sulphate, and urea decrease it; Nährstoff-Heyden increases it above that in water controls. Sealed agar slants of *Nitrobacter* were kept more than 1 year without serious injury to the oxidative power.—*W. J. Robbins.*

1665. HARDY, F. A preliminary investigation into the occurrence of different kinds of carbonates in certain soils. *Jour. Agric. Sci.* 11: 1-18. 1921.—Samples of marine silt from the foreshore of the N. W. coastal belt of the Wash were found to contain dolomite. Studies were made to ascertain the effect of dolomite on such processes as nitrification in which the neutralizing effect of a quick-acting base is essential. Culture experiments tended to strengthen the view that dolomite has a definite effect on nitrification, and this view was further strengthened by an investigation of the nature of the carbonate in soils of which the geological and agricultural history is known. A technique for the estimation of the easily decomposed ("Calcitoid") and more stable ("Dolomitoid") carbonates was developed. Marine silts may be expected to contain calcitoid and dolomitoid carbonate; other soils do not generally contain the latter type of carbonate. Cultivation reduces the carbonate content of the soil, especially of calcitoid soils. Acidity may occur in soils containing both types of carbonates when the total carbonate content is greater than the amount considered necessary to prevent acidity. The reason for this is that the dolomite types of carbonate are not easily affected by the weak acids of the soil.—*V. H. Young.*

1666. HARDY, F. Substitutes for pen manure. *Agric. News [Barabados]* 20: 21. 1921.—The author discusses various materials used in India to replace pen manure, such as oil cake, green manures, top soil from virgin forests or high jungles, earth from scrub jungles, earth from grass land, and tank silt. Not many of these substances are available to the average West Indian planter, to whom the author suggests the employment of scrub from waste places, rank herbage (including tall grasses), road sweepings, trimmings of trees, rotted lime or orange skins and seeds, waste green stuff from the banana, cacao and coconut crops, filter and scums from sugar factories, and cotton seed meal.—*J. S. Dash.*

1667. HIBBARD, P. L. Sulfur for neutralizing alkali soils. *Soil Sci.* 11: 385-387. 1921.—The addition of sulphur to alkali soils was found to reduce the alkalinity and to improve the conditions for plant growth.—*W. J. Robbins.*

1668. JOHNSON, MAXWELL O., AND KIM A. CHING. Report of the Chemical Division. Hawaii Agric. Exp. Sta. Rept. 1919: 40-44. 1920.—A progress report on fertilizer experiments with bananas and pineapples is presented. In spraying pineapples on manganese soil an application of as much as 3,000 pounds of iron sulphate to the acre was unsuccessful in preventing chlorosis, while considerably less than 50 pounds per acre applied to the pineapple leaves promptly checked the chlorosis.—*J. M. Westgate.*

1669. MARCHAND, B. DE C. The soils of Natal and the Transvaal. II. The soils of the Transvaal. South African Jour. Indust. 4: 181-187. 1921.

1670. MASCHHAUPT, J. G. Onderzoek naar de oplosbaarheid in met koolsuur verzadigd water van het in Thomasphosphaat en enkele andere phosphaten aanwezige phosphorzuur. [Investigation on the solubility of the acid phosphate contained in Thomas slag and other phosphates in carbon dioxide saturated water.] Verslag. Landbouwk. Onderzoek. Rijkslandbouw-proefsta. 23: 57-84. 1919.

1671. PATE, W. F. II. Results of Phos-pho-germ, experiments conducted during 1919-1920. Bull. North Carolina Dept. Agric. 1921: 14-16. May, 1921.—Tests with rye, corn, and cotton show that the use of Phos-pho-germ gives little or no increase in crop yields.—*F. A. Wolf.*

1672. SURR, G., and R. VAILE. Some notes on the "dry bag" soils of the foothill districts, Tulare County, California. Monthly Bull. Dept. Agric. California 10: 41-46. 1921.—It is believed that the shrinkage and the resulting cracks and dry-bag structure of certain adobe soils are mainly due to the presence of large amounts of plastic or colloidal clay-like material, with a corresponding lack of quartz and of the coarse resistant minerals in quantity to act as "fillers" and thus reduce the otherwise inevitable great shrinkage. Experiments indicate that it is highly desirable to permit the soil to crack somewhat after irrigation before practicing any tillage.—*E. L. Overholser.*

1673. WILLIAMS, C. C. The soils of Natal and the Transvaal. I. The composition of Natal soils. South African Jour. Indust. 4: 177-181. 1921.

## TAXONOMY OF VASCULAR PLANTS

J. M. GREENMAN, *Editor*

E. B. PAYSON, *Assistant Editor*

(See in this issue Entries 1145, 1277, 1311, 1486, 1487, 1496, 1503, 1603)

## MISCELLANEOUS, UNCLASSIFIED PUBLICATIONS

B. E. LIVINGSTON, *Editor*

S. F. TRELEASE, *Assistant Editor*

1674. ANONYMOUS. Commission internationale pour l'exploration scientifique de la mer Méditerranée. Conference de Madrid, 17-20 Nov., 1919. [International commission for the scientific exploration of the Mediterranean Sea. Conference in Madrid, Nov. 17-20, 1919.] Commission Internat. Exploration Sci. Mer Méditerranée Bull. 1. 24 p. 1920.—A meeting was called of delegates from the countries bordering on the Mediterranean, with a view to organizing for a scientific study of that sea. The organization comprises a central bureau to coordinate the work of the stations in each country. The publication of the results will be largely in the hands of the central bureau, of which the Prince of Monaco is the president. Publication will be in English, Spanish, French, Greek, and Italian. Memoirs on oceanography are contemplated, and an atlas of the flora and fauna of the Mediterranean will be begun with the edible animals. The stations are to have uniform recording instruments,



and are to study the biology and geographical distribution, of the useful animals, the marine plants, and the plankton.—*T. C. Frye*.

1675. BARNARD, J. E. Microscopy with ultra-violet light. *Sci. Amer. Monthly* 3: 219-220. 5 fig. 1921. [Reproduced from *Nature* 106: 378-381. 1920 (see Bot. Absts. 8, Entry 2255).]

1676. BEY, CHARLES AUDEBEAU. Utilization des tiges de diverses plantes annuelles en vue de la production de l'énergie mécanique nécessaire aux travaux agricoles de la vallée du Niger. [The utilization of the stems of annual plants for the production of mechanical energy necessary to the agricultural activities in the valley of the Niger.] *Compt. Rend. Acad. Sci. Paris* 172: 764-766. 1921.—The combustion of plant products as a source of energy is considered. It is found that waste parts of cotton and other crops can be used in this way.—*C. H. Farr*.

1677. BROWN, W. H. Wild food plants of the Philippines. *Bur. Forest. Philippine Islands Bull.* 21. 165 p., 81 pl. 1920.—The species are arranged in botanical sequence under families and genera. It is the most comprehensive work of its kind so far issued in relation to the Philippine flora.—*E. D. Merrill*.

1678. CREVOST, C., ET C. LEMARIÉ. Plantes et produits filmenteux et textiles de l'Indochine. [Plant fiber and textile products of Indochina.] *Bull. Econ. Indochine* 23: 209-231, 406-433. 1920.—A continuation of the series (see Bot. Absts. 6, Entry 1539) covering the palms, bamboos, Cyperaceae, *Pandanus*, and miscellaneous vines of various families.—*E. D. Merrill*.

1679. JURITZ, CHAS. F. Raw materials for industrial alcohol production. *South African Jour. Indust.* 4: 167-173. 1921.

1680. NICHOLS, GEORGE E. [Rev. of: HEDRICK, U. P. Sturtevant's notes on edible plants. *Rept. New York Agric. Exp. Sta. (Geneva)* 1919: 17-686. 1920 (see Bot. Absts. 8, Entry 862).] *Torreya* 21: 50-52. 1921.

1681. VON BLON, J. L. California's seaweed industry. *Sci. Amer.* 123: 445, 458. 2 fig. 1920.—The article concerns itself with the manufacture and uses of agar-agar.—*Chas. H. Otis*.

1682. WEST, A. P., AND W. H. BROWN. Philippine resins, gums, seed oils, and essential oils. *Bur. Forest. Philippine Islands Bull.* 20. 230 p., 73 pl. 1920.—The authors present a comprehensive treatise, from both a botanical and a chemical standpoint. Most of the species considered are illustrated.—*E. D. Merrill*.

1683. WILLIAMS, S. G. Manila hemp. *Sci. Amer. Monthly* 3: 255-257. 8 fig. 1921.—A brief account is given of primitive methods of obtaining fiber from the banana plant abacá (*Musa textilis*), as practiced in the Philippines.—*Chas. H. Otis*.



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## INFORMATION CONCERNING BOTANICAL ABSTRACTS, *Continued*

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